

CDM FEDERAL PROGRAMS CORPORATION a subsidiary of Camp Dresser & McKee Inc.

June 14, 1995

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Hazardous Materials Management Division
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Agency of Natural Resources
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SUBJECT:

EPA Contract No.: 68-W9-0045 Work Assignment No.: 23-1JZZ

Final Site Inspection Prioritization Report Boise Cascade/North Landfill/Lagoon

Sheldon Springs, Vermont TDD No.: 9305-25-ACX

CERCLIS No.: VTD981885270

DOCUMENT NO.:

7710-023-ST-BRJD

Dear Mr. Schwer:

One copy of the Final Site Inspection Prioritization Report for Boise Cascade/North Landfill/Lagoon, in Sheldon Springs, Vermont, is enclosed. If you have any comments or questions regarding this submittal, please contact me at (617) 742-2659.

Very truly yours,

CDM FEDERAL PROGRAMS CORPORATION

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ARCS I

Final Site Inspection Prioritization Report

Boise Cascade/North Landfill/Lagoon

Sheldon Springs, Vermont

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY, Region I Waste Management Division Boston, MA

Work Assignment No.: 23-1JZZ

EPA Region: I

CERCLIS No.: VTD981885270

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Final Site Inspection Prioritization Report Boise Cascade/North Landfill/Lagoon Sheldon Springs, Vermont

CERCLIS No. VTD981885270 TDD No. 9305-25-ACX Work Assignment No. 23-1JZZ 7710-023-FR-BRJC

INTRODUCTION

The CDM Federal Programs Corporation (CDM) Alternative Remedial Contracting Strategy (ARCS) team was requested by the U.S. Environmental Protection Agency (EPA) Region I Waste Management Division to perform a Site Inspection Prioritization (SIP) of the Boise Cascade/North Landfill/Lagoon (Boise Cascade/NLL) property in Sheldon Springs, Vermont. Tasks were conducted in accordance with the ARCS Contract No. 68-W9-0045, the SIP scope of work dated September 3, 1992, and technical specifications provided by EPA under Work Assignment No. 23-1JZZ, which was issued to CDM on September 22, 1992. A Preliminary Assessment (PA) was completed in April 1987 by the Vermont Agency of Environmental Conservation (VTAEC), Waste Management Division (now the Vermont Department of Environmental Conservation [VTDEC], under the Vermont Agency of Natural Resources). On the basis of the information provided in the PA report, the Boise Cascade/NLL Site Inspection was initiated. A Site Inspection (SI) report was completed by NUS Corporation on May 26, 1988. Updated information encountered during the SIP process is included in this report. Relevant text from the SI report is presented in this report in a smaller font.

Background information used in the generation of this report was obtained through file searches conducted at VTDEC, telephone interviews with town officials, conversations with persons knowledgeable of the Boise Cascade/NLL property, and conversations with other federal, state, and local agencies. Additional information was collected during the CDM onsite reconnaissance on October 4, 1994, and environmental sampling on November 15, 1994. Boise Cascade/NLL was formerly known as Boise Cascade North; the name was changed by EPA in 1994.

This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. However, these documents do not necessarily fulfill the requirements of other EPA regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other federal, state, or local regulations. SIPs are intended to provide a preliminary screening of sites to facilitate EPA's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

SITE DESCRIPTION

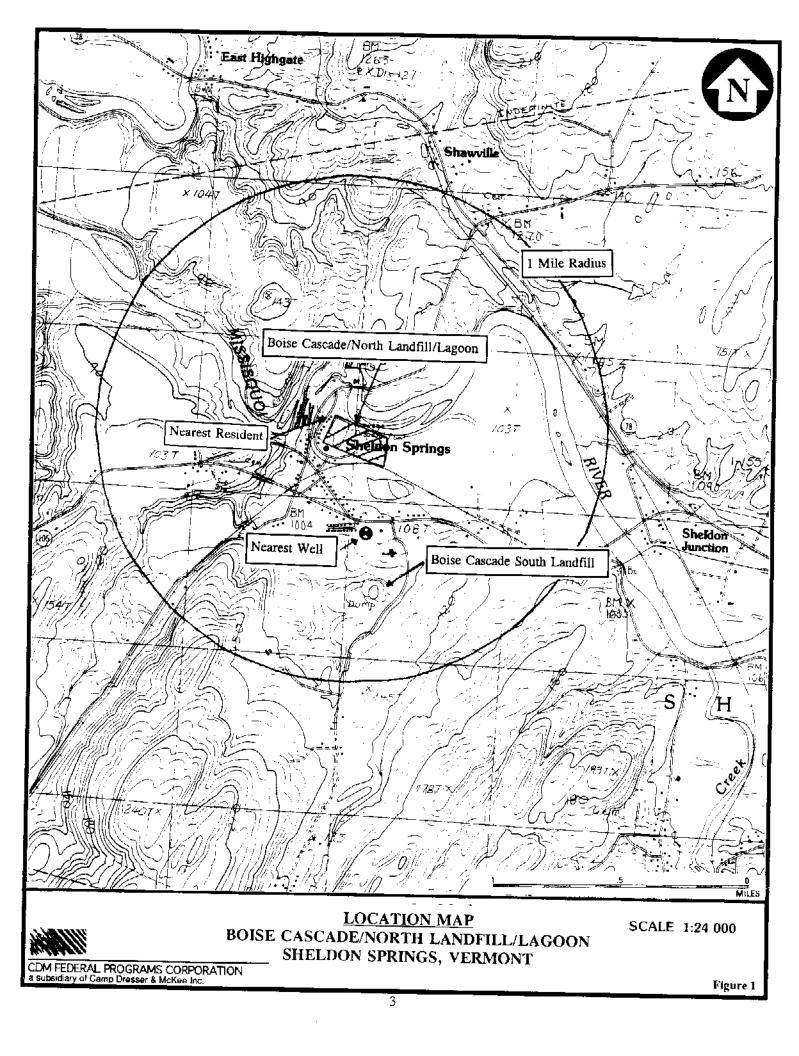
Boise Cascade/North Landfill/Lagoon (Boise Cascade/NLL) is located off Mill Street in Sheldon Springs, Franklin County, Vermont (latitude 44° 54′ 27.7″ N, longitude 72° 58′ 24.1″ W) (see Figure 1: Location Map) [46,52]. A paper mill complex located in Sheldon Springs has been operating since 1955 under many different owners/operators; it is currently active. Over the years, the complex has encompassed the paper mill, the wastewater treatment system, and two landfills [37]. The subject of this SIP is the industrial landfill used from 1955 to 1974 (known as the north landfill or old landfill) and the active wastewater treatment aerated lagoon (the lagoon), in use since 1974 [37]. The landfill and lagoon are located on adjacent, but separately owned, properties (see Figure 2: Site Sketch) [6,11].

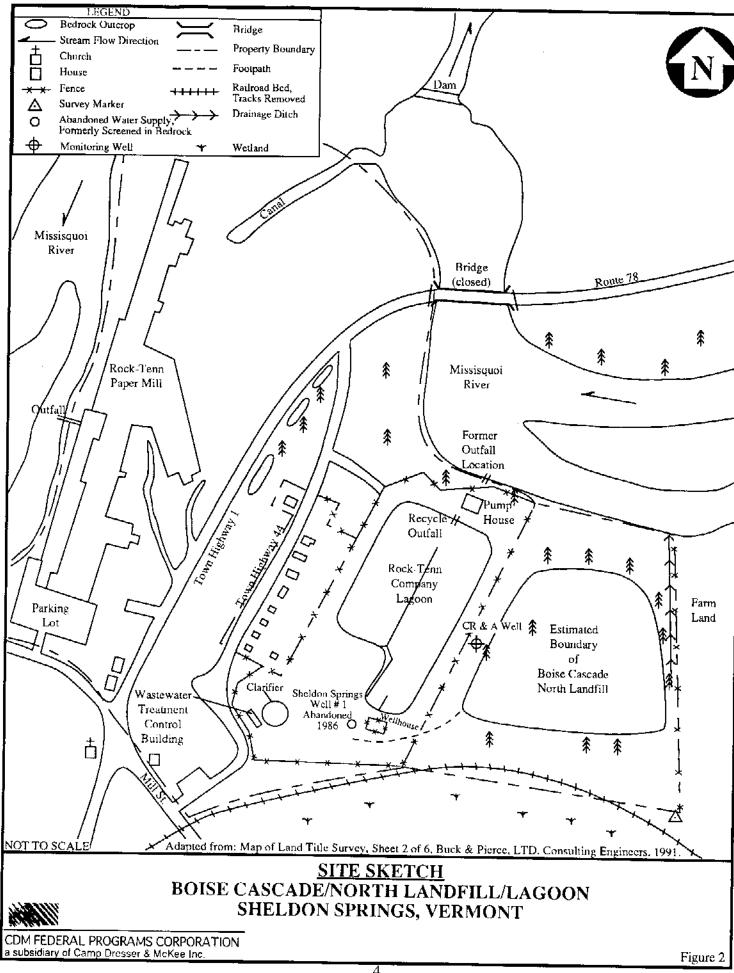
The landfill is located on an undeveloped, and fairly isolated, piece of land to the east of the lagoon. The landfill is bordered by the Missisquoi River to the north, by farmland to the east, by a former railroad bed to the south, and by the lagoon property to the west. The property is heavily overgrown with vegetation. Low-lying wetland areas are also located to the south of the landfill. There are no buildings on this property [6,8,37,52]. The acreage of the landfill property is estimated to be 14 acres [6]. The landfill does not cover the full property; however, the exact acreage of the landfill is not documented.

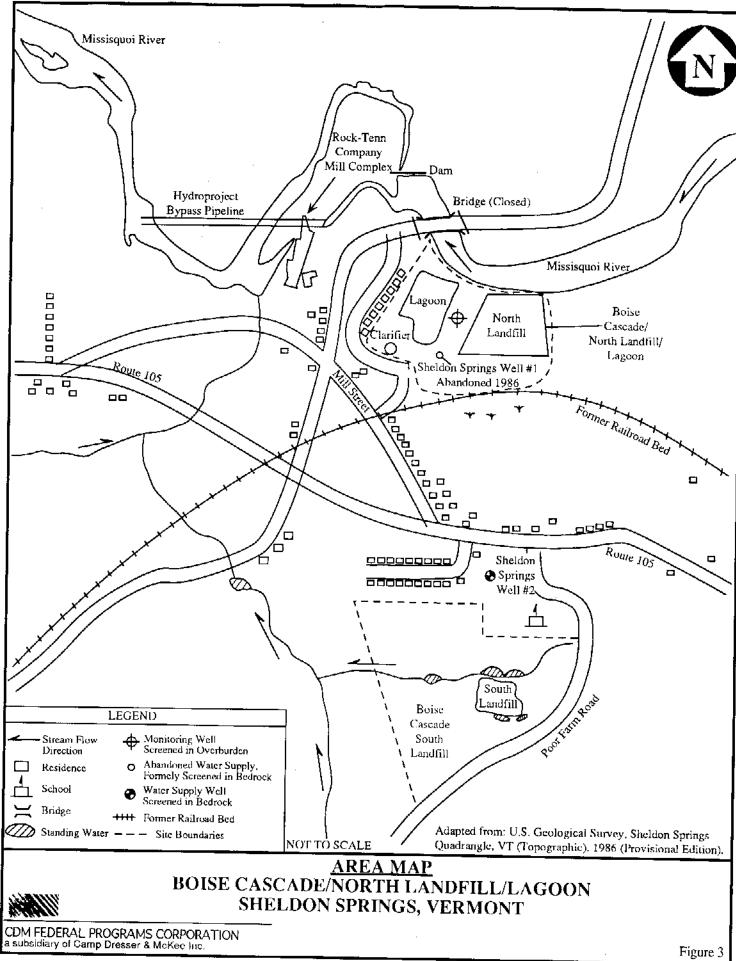
The lagoon is part of an active wastewater treatment system. Pretreatment wastewater is pumped through underground pipes from the paper mill complex to the wastewater treatment area east of the mill [8]. The paper mill complex is located on a property 600 fect farther west of the lagoon. Wastewaters are treated by the wastewater treatment system, consisting of the primary clarifier and the lagoon. Wastewater from the lagoon outfalls to a pipe that flows back to the paper mill, eventually discharging to the Missisquoi River [8]. The lagoon is bordered to the north by the Missisquoi River, to the east by the landfill, to the south by Mill Street, and to the west by private residences. The lagoon is approximately 425 feet by 575 feet by 25 feet deep; the estimated volume of the lagoon is 6.1 million cubic feet [8]. On the lagoon property is also the wastewater treatment control building [6,8,37,52]. A former elementary school was located on this property; the date of its destruction is unknown. A wellhouse for former Sheldon Springs town well #1 is still located on the property (see Figure 3: Area Map) [8].

The Boise Cascade North paper mill complex is located in the center of Sheldon Springs, a village of Sheldon. It is uncertain what this property was used for prior to landfilling, but based on VTAEC assessment it was most likely farmland. The area immediately surrounding the facility is rural [and residential] [37].

The properties are primarily flat, sloping down to the river along the northern boundary. Along this edge of the property, to the north of both the lagoon and the landfill, runoff drains to the Missisquoi River. Runoff from the landfill will also drain to and settle in low-lying areas to the south and west [52]. To the east of the landfill is a small drainage ditch, which appears to drain runoff from both the eastern portion of the landfill and the adjacent farmland [8]. Runoff in the lagoon area settles in the low-lying area surrounding the lagoon on the east and south sides. Runoff from the east side of the lagoon would drain onto the landfill property [52]. There are no paved areas on the lagoon or landfill properties [8].







OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS

Saxon Industries (Saxon) operated the paper mill complex (including the two landfills) from 1955 to 1983. The north landfill, operated from 1955 to 1974, was closed and a new landfill (the south landfill) was opened [37]. The south landfill is also a CERCLIS site, referred to as Boise Cascade South Landfill (VTD095247185) [46]. In 1983, Boise Cascade Corporation (Boise) purchased the entire complex, including the two landfills, and proceeded to close the south landfill [37]. Boise reportedly did not deposit any materials into either of the landfills [28]. The mill complex, defined as the mill and the wastewater treatment system, has since changed ownership two more times. In 1989, Boise sold the mill complex to Specialty Paperboard, Inc. [11,28]. However, Boise has retained ownership of the properties encompassing the two landfills [7,8,11]. In March 1993, Rock-Tenn Company (Rock-Tenn) purchased the mill complex and currently operates the mill as a 100 percent recycled fiber paper mill [8].

The [north] landfill was used [by Saxon Industries] for general solid waste produced by the paper mill operations. Around 1970, federal water pollution control regulations required tree bark, produced by the paper mill and previously dumped into the Missisquoi River, to be trucked to the landfill for disposal. Soon after, paper sludge from the adjacent wastewater treatment plant was also disposed of at the landfill. The landfill was used by Saxon Industries for the disposal of sludge for approximately four years. The total amount of sludge disposed of during this time was approximately 8,400 to 12,000 tons. This continued until 1974 when landfilling was moved to a new disposal site [Boise Cascade South Landfill] on Poor Farm Road in Sheldon. No information was found regarding closure plans or permits for the landfill [37]. [The closure was approved by the VTAEC to include 2 feet of sludge and bark cover with topsoil and seed] [10].

In 1973, Saxon had five wastewater samples analyzed for the following: alkalinity, biochemical oxygen demand (BOD), chemical oxygen demand (COD), solids (total, suspended, dissolved, and volatile), ammonia, total Kjeldahl nitrogen, nitrate, phosphate, sulfate, sulfite, color, turbidity, phenol, aluminum, and zinc. It is presumed that, at the time, Saxon was considering making a change in the wastewater treatment system because the results indicate that one sample was treated with a polymer and the others were not. Hazardous substances with increases in effluent concentration (given in parentheses) over influent concentration include phenol (0.009 milligrams per liter (mg/l)) and aluminum (1.9 mg/l) [41].

Saxon originally obtained a National Pollutant Discharge Elimination System (NPDES) permit in 1974 for discharges to the Missisquoi River. Discharges included sanitary waste, river water used for power generation, cooling water, industrial wastewater from the wastewater treatment system, and the sand filter backwash. The permit required monitoring of the discharges for pH, BOD, total suspended solids (TSS), turbidity, total phosphorus, and total zinc [37]. The current NPDES permit (VT0000469) covers two discharges: cooling waste from a condensor for turbines (not in use by Rock-Tenn), and the wastewater treatment plant discharge. The permit gives discharge limitations and monitoring requirements for flow and temperature on cooling water, and BOD, TSS, total phosphorus, total Kjeldahl nitrogen, and pH on treated process water [23,54].

The lagoon, completed in 1974, was constructed over a portion of the landfill. The lagoon was designed to provide secondary treatment of the paper mill wastewater and is still in use. An

underdrain system was constructed beneath the lagoon to collect any discharge from leakage through the liner and discharge it to the Missisquoi River. The underdrain system consists of a manifold of perforated pipes located in a bed of sand under the lagoon liner. The liner, manifold and sand layer are underlain by a layer of clay. In the event of a breach in the liner, the underdrain system was designed to prohibit wastewater from entering the underlying aquifer. . .[37].

Saxon Industries notified EPA as a RCRA exempt small quantity generator in 1980 [42]. Since 1980, the RCRA program has been notified of the transfers of ownership [42,45,48].

In November 1985, a leak in the liner of the lagoon allowed the lagoon contents to bypass the underdrain system and possibly to come into contact with the underlying overburden. Effluent was also discharged to the Missisquoi River. A "temporary pollution permit" was obtained to allow Boise Cascade to drain the lagoon by pumping to the Missisquoi River and allowing the leak in the underdrain system to drain the lagoon. The total flow to the Missisquoi River was estimated to be between 150 to 200 gallons per minute over a period of several days. Sampling of the river water was not performed at the time of the discharge. Repairs to the liner were completed in early 1986 [37].

Following the rupture in the lagoon liner, the Vermont Department of Health tested both Sheldon Springs Wells No. 1 and No. 2. No volatile organic compounds (VOCs) were detected in the samples. Inorganics were well below Maximum Contaminant Levels (MCLs), except for sodium. Semivolatile organic compounds (SVOCs), including pentachlorophenol (PCP) and methylene bisthiocyanate (MBT), were not detected above detection limits in the samples [32].

The threat of contamination from the lagoon leak to the Sheldon Springs water system (wells No. 1 and No. 2, located 100 feet southwest and 2,000 feet southeast, of the facility respectively) prompted Boise Cascade officials and the Vermont Department of Health (VT DOH) to advise Sheldon Springs to close well No. 1 until testing was complete. The well was kept available as a backup to well No. 2. In March of 1986, the detection of pentachlorophenol . . . [trace, <1 parts per billion (ppb)] . . . in a groundwater sample from well No. 1 led to its shutdown [37].

The lagoon was updated in 1986 with the addition of a submersible pump that is designed to collect any discharge from the underdrain and recycle it to the lagoon [10,40]. The underdrain system currently consists of a manifold of perforated pipes located in a bed of sand between two layers of liner [8].

Boise Cascade/NLL was listed in the CERCLA Information System (CERCLIS) on February 5, 1987 [46]. A PA was completed by the VTAEC Waste Management Division in April 1987. An SI report was completed by NUS Corporation on May 26, 1988 [37].

Limited information is available on operations during Saxon's ownership of the mill. The following is a description of mill operations as described by Boise personnel in 1986 [10,37].

The mill uses water driven grinders to produce approximately 50 tons per day of groundwood pulp. Chemicals or bleaches are not used in this process; however, Nalcon 85PC014 (a carbamate) is used to control bacterial growths on the system [37].

In addition to the pulp, the mill uses about 100 tons daily of purchased fibers (virgin chemical pulps and recycled waste papers). Sizing (stiffening) of the paper is produced by the addition of rosin size and alum. Starches and some mineral fillers (talc and calcium carbonate) may also be added to the paper. Mold or fungal deposits on the papermaking machines are controlled by the addition of . . [Nalco 7620WB, a water based emulsion of 10 % active] . . . methylene bis-thiocyanate (MBT). Some grades of paper produced at the mill require the addition of a fungicide, PCP (pentachlorophenol), in order to provide long-term mold protection. In 1985, the use of PCP was replaced by Nalcon 7647 (1.15% 5-chloro-2-methyl-4- isothiazolin-3-one and 0.35% 2-methyl-4-isothiazolin-3-one) [10,37].

PCP was used in the production of 15 to 20 percent of the grades of paper produced by the mill as of 1986. For these grades of paper, 3 to 5 pounds of PCP were added per ton of paper produced. In 1986, the mill produced 150 tons of paper per day [62]. At these 1986 rates, as much as 150 pounds of PCP could have been used each day at the mill.

Wastewater from the mill is clarified in a 120-foot primary clarifier from which sludge is removed and thickened before disposal. Until 1983, sludge was disposed of in . . [Saxon Industries']. . . own landfill[s]. After April 1983, the paper mill sludge was trucked to Youngs Landfill in Highgate, Vermont [37].

. . . Since 1982, Sheldon Springs well No. 1 and No. 2 have been sampled by the Vermont Department of Health three to four times a year for water quality parameters including metals and volatile organic compounds. These analyses have detected total phenols ranging from 0.02 to 0.08 parts per million (ppm), methylene bis-thiocyanate at 0.0074 ppm, and a trace amount of pentachlorophenol (PCP) (< 1 parts per billion (ppb)). Phenols were also detected in groundwater samples from a well point located near the wastewater treatment lagoon [37].

Sludge samples from the wastewater treatment plant [primary clarifier] were analyzed by Aquatec Environmental Services of Burlington, Vermont, and NUS Corporation of Pittsburgh, Pennsylvania, for Boise Cascade in 1985. The following volatile organic compounds were detected: chloroform (5 ppb), methylene chloride (10 ppb), toluene (17 ppb), acetone (350 ppb), and 2-butanone (69 ppb). (The values for methylene chloride and chloroform are the detection limits for those compounds. The compounds were analyzed for and detected but at a concentration not reliably quantifiable.) Pentachlorophenol was detected at 34,000 ppb, and phenol was detected but at a concentration "not reliably quantifiable" (values for volatile organic compounds, pentachlorophenol and phenol are in wet weight). Arsenic was detected at concentrations ranging from 0.2 to 20.0 ppm, cyanide from 1.3 to 7.0 ppm, and copper from 19.7 to 133.0 ppm. These results indicate that the sludge placed into the landfill could provide a source for the compounds found in the Sheldon Springs well No. 1 [37].

Sludge samples were analyzed again in July 1985. VOC analysis of the sludge detected the following contaminants: toluene (37 milligrams per kilogram [mg/kg]), acetone (150C mg/kg), and 2-butanone (10K mg/kg). The qualifier C indicates the result has been corrected for the presence of the compound in the blank. The qualifier K indicates the compound was analyzed for and detected, but at a concentration not reliably quantifiable. The number is the detection limit for the compound. Quantitation of the concentration of methylene chloride in the sludge was not possible due to the relative concentration of the compound in the blank. No SVOCs were detected above detection limits in this sludge sample. Inorganics detected in the sludge (with highest concentration in parentheses) included cadmium (0.96 mg/kg), copper (32.1

mg/kg), lead (1.55 mg/kg), nickel (2.85 mg/kg), zinc (6.4 mg/kg), arsenic (0.49 mg/kg), and cyanide (1.16 mg/kg) [2].

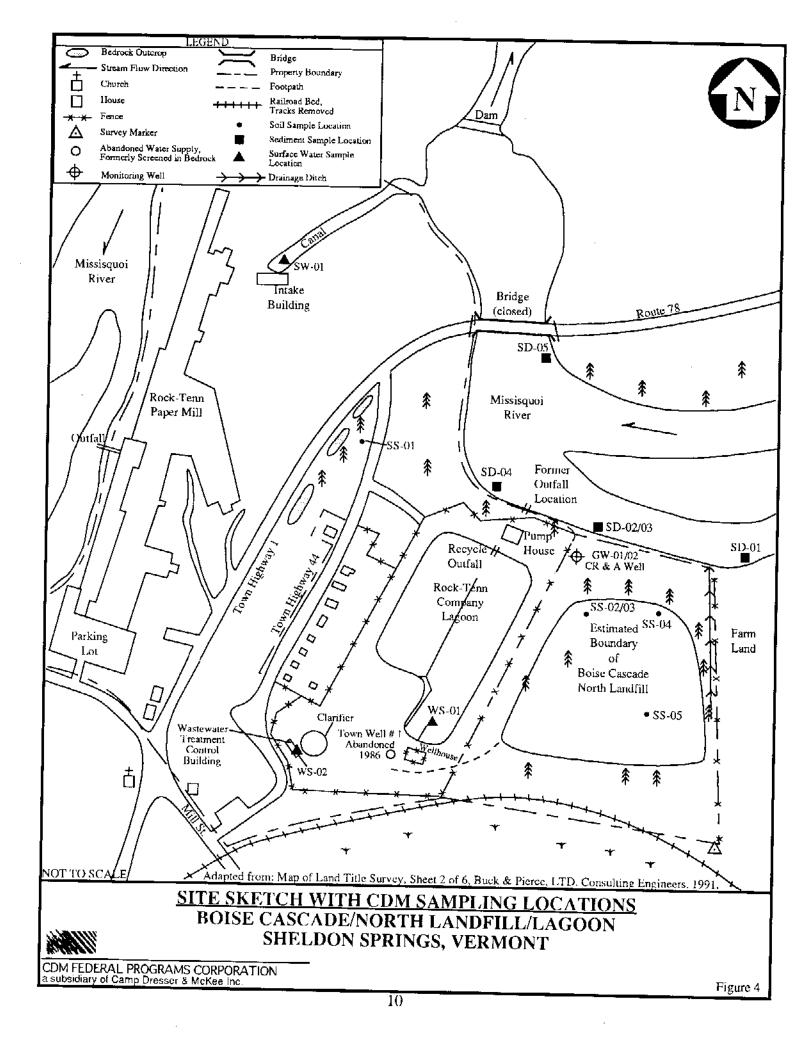
The sludge samples may or may not represent contaminants associated with waste sources as identified in this SIP. The sludge samples were collected from the primary clarifier, and the primary clarifier is online before the lagoon. Therefore, sludge contaminants may or may not be indicative of contaminants in the wastewater in the lagoon. The primary clarifier has not been identified as a waste source for this SIP. Also, because the sludge samples were collected and analyzed in 1985, and the north landfill closed in 1974, the 1985 sludge may or may not be similar to the sludge deposited in the north landfill. The results of the sludge analysis are presented to indicate types of contaminants that may be associated with the onsite waste sources.

A sample of treated effluent from the Rock-Tenn wastewater treatment system and a Missisquoi River aqueous sample were collected in May 1992 and analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. The treated effluent concentrations compared to river water concentrations indicate increases in the following substances (effluent concentrations given in parentheses): toluene (2J micrograms per liter $(\mu g/I)$), acctone (33 $\mu g/I$), and phenols (4 $\mu g/I$). The qualifier J indicates that the concentration is an estimated value [3].

During CDM's onsite reconnaissance, CDM toured the Rock-Tenn mill. Currently, the mill is operated as a 100 percent recycled fiber, non-deink paper mill, generating 180 to 200 tons of heavy grade carton per day. Recycled fibers are slurried in water to form a pulp. Process water is taken in from the Missisquoi River, treated with bleach, and run through a sand filter. Biocides are still used in the process; they are added to the pulp/slurry before formation of the paper product, as well as sometimes being added to the paper machine. Use of the biocides varies seasonally. Nalco 7640-M Slimicide, containing 2-butanone, was used at approximately 1,230 pounds per month over 1993 and 1994 [8,35]. Nalco 7614 Liquid was used at an average rate of 6,228 pounds per month over 1993 and 1994 [8,36]. All wastewaters created throughout the mill are either recycled or treated in the wastewater treatment system and eventually discharged to the Missisquoi River. Wastewater sludge is continuously recycled at the mill by adding it to the paper pulp; a minimal amount of sludge (two truckloads) is taken each year to a landfill [8].

Also during the reconnaissance, CDM walked the properties encompassing the lagoon and landfill. The landfill is overgrown with trees, bush, and grass, and its boundaries are difficult to identify. One area of paper sludge remnants was noted along the old railroad bed [8].

On November 15, 1994, CDM field personnel collected five surface soil samples, five sediment samples, two groundwater monitoring well samples, one surface water sample, and two lagoon samples from Boise Cascade/NLL (see Figure 4: Site Sketch with CDM Sampling Locations) [7]. Sampling included one duplicate of each sample type (waste source, surface soil, sediment, and groundwater) for quality control. The purpose of the sampling event was to determine types and concentrations of hazardous substances onsite and to investigate migration of hazard substances from the site. Field activities were performed according to the Task Work Plan for Onsite Reconnaissance and Sampling at Boise Cascade North, with the exceptions discussed in the Trip Report for Onsite Reconnaissance and Sampling Activities submitted to EPA on November 23, 1994 [9]. All samples were submitted for full Target Compound List (TCL) and



Target Analyte List (TAL) analysis through the EPA Contract Laboratory Program (CLP) Routine Analytical Services (RAS). All samples collected met data quality objectives as outlined in the Task Work Plan. The inorganic and organic analytical results were reviewed according to EPA Tier II data validation protocols [38,39]. See the Waste/Source Sampling, Groundwater Pathway, and Surface Water Pathway sections for sampling results. In 1994, EPA changed the name of Boise Cascade North to Boise Cascade/North Landfill/Lagoon [27].

Table 1 presents identified structures or areas on the Boise Cascade/NLL property that are potential sources of contamination, the containment factors associated with each source, and the relative location of each source.

TABLE 1

Source Evaluation for
Boise Cascade/North Landfill/Lagoon

Potential Source Area	Containment Factors	Spatial Location
Landfili	Cover material: 2 feet of sludge and bark cover with heavy vegetation	Northeast portion of site; property owned by Boise Cascade Corporation
Lagoon	Recycling underdrain system with layers of liner material	North-central portion of site; property owned by Rock-Tenn Company
Contaminated soil	None	Northeast portion of site (at and surrounding the landfill); property owned by Boise Cascade Corporation

[6,8,10,38,39,40]

Table 2 summarizes the types of potentially hazardous substances that have been disposed of, used, or stored on the property. The table was developed based on historic information and results of sampling performed by CDM. Table 2 does not include substances detected in 1985 sludge samples. As the landfill was closed in 1974, substances detected in the sludge in 1985 may or may not be representative of substances present in sludge before 1974.

The only other property listed in CERCLIS within 1 mile of Boise Cascade/NLL is Boise Cascade South Landfill (VTD095247185) [46]. The only property listed in RCRIS in the town of Sheldon is Rock-Tenn (VTD095247185) [48]. While this CERCLIS property and this RCRIS facility have the same EPA identification number, they are currently owned by two different entities: Boise and Rock-Tenn, respectively [8].

TABLE 2
Hazardous Waste Quantity for Boise Cascade/North Landfill/Lagoon

				
Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Methylene bisthiocyanate (MBT) *	Undetermined	Undetermined	NA	Lagoon and Iandfill
PCP *	Undetermined; as much as 150 pounds per day used by the mill	Unknown start date through 1985	NA	Lagoon and landfill
2-Butanone *	Component of a product used at a rate of 1,230 pounds per year	Start date unknown; currently in use	NA	Lagoon
Acetone	Lagoon volume = 6,100,000 ft ³	NA	NA	Lagoon
Mercury	Lagoon volume = 6,100,000 ft ³	NA	NA	Lagoon
Sodium	Lagoon volume = 6,100,000 ft ³	NA	NA	Lagoon
Calcium	Lagoon volume = 6,100,000 ft ³	NA	NA	Lagoon and contaminated soil
Phenois	Lagoon volume = 6,100,000 ft ³	NA	NA	Lagoon
Toluene	Lagoon volume = 6,100,000 ft ³	NA	NA	Lagoon
Magnesium	Undetermined	NA	NA	Contaminated soil
Nickel	Undetermined	NA	NA	Contaminated soil
Potassium	Undetermined	NA	NA	Contaminated soil
Copper	Undetermined	NA	NA	Contaminated soil
Lead	Undetermined	NA	NA	Contaminated soil
Zinc	Undctermined	NA	NA	Contaminated soil
Cyanide	Undetermined	NA	NA	Contaminated soil

TABLE 2 (continued)

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Polynuclear aromatic hydrocarbons (PAHs)	Undetermined	NA	NA	Contaminated soil
Methylene chloride	Undetermined	NA_	NA	Contaminated soil

NA = Not applicable

Note: Substances detected in 1985 sludge samples are not automatically included in this table because the landfill was closed in 1974, and therefore substances detected in the sludge in 1985 may or may not be representative of substances present in sludge deposited in the landfill before 1974, or present in the lagoon.

[35,36,37,38,39]

WASTE/SOURCE SAMPLING

On November 15, 1994, CDM collected four grab surface soil samples from potential source areas surrounding and on the landfill in addition to a background sample at Boise Cascade/NLL. All samples from potential source areas were collected from 2 to 8 inches below ground surface (bgs). The background sample was collected from an area of high elevation, 25 feet west of Town Highway (TH) 44, the road west of the lagoon [6,8]. Figure 4 illustrates the approximate locations of the samples. Table 3 is a summary of landfill source samples collected by CDM.

^{* =} Substances not detected in source samples collected by CDM but use is documented in the Boise Cascade paper mill process. PCP was also detected in 1985 wastewater treatment plant sludge samples.

TABLE 3

Sample Summary: Boise Cascade/North Landfill/Lagoon
Landfill Source Samples Collected by CDM on November 15, 1994

Sample Location No.	CDM Sample #/ Traffic Report #	Time (hrs)	Remarks/ Sample Depth/ Description	Sample Source
SS-01	MAFT71 (I) AJJ74 (O)	1630	Grab/2 to 6 inches/medium to dark brown fine organic loam	From an area of high elevation, 25 feet west of TH 44; reference sample
SS-02	MAFT72 (I) AJJ75 (O)	1015	Grab/2 to 8 inches/dry, compact, homogeneous gray clay with brown sand, trace organic, trace paper fibers	North face of the landfill approximately 75 feet sou of the Missisquoi River, and 50 feet east of the Rock-Tenn Company fend
SS-03	MAFT73 (I) AJJ76 (O)	1015	Grab/2 to 8 inches/same as SS-02	Duplicate of SS-02 for Q
SS-04	MAFT98 (I) AJJ77 (O)	1040	Grab/2 to 6 inches/medium brown organic with brown sand, some fine silt and medium brown sand	North face of the landfill approximately 75 feet sou of the Missisquoi River ar 75 feet west of the easter property line
SS-05	ΜΛ FT99 (I) AJJ78 (O)	1130	Grab/2 to 6 inches/brown organic loam, medium and light brown fine sand, silt, and clay with some organic matter	25 feet east of the depression near the center of the landfill, approximately 50 feet nort of the railroad bed
EB-SS	MAFW14 (I) AJJ94 (O)	0900	Grab	Surface soil sampling equipment rinsate; for QC of decontamination procedures

I = RAS Inorganic Analysis
O = RAS Organic Analysis

TH = Town Highway

[8,38,39]

CDM also collected an aqueous grab sample (WS-01) from the Rock-Tenn lagoon. This sample was collected near the lagoon outfall such that the sample collected essentially represents the lagoon effluent [8]. Additionally, Rock-Tenn used a peristaltic pump to collect a composite effluent sample over a 24-hour period. The effluent is pumped from the outfall channel to a sample container held in a refrigerator. CDM split this sample (WS-02) with Rock-Tenn and

had it analyzed along with the grab sample [24]. Table 4 presents a summary of source samples collected by CDM. A surface water sample (SW-01) serves as a background sample. SW-01 was collected from the Missisquoi River, prior to the process water intake for the Rock-Tenn mill [8].

TABLE 4

Sample Summary: Boise Cascade/North Landfill/Lagoon
Lagoon Source Samples Collected by CDM on November 15, 1994

Sample Location No.	CDM Sample #/ Traffic Report #	Time (hrs)	Remarks/ Sample Depth	Sample Source
SW-01	MAFW13 (I) AJJ92 (O)	0930	Grab/3 to 4 feet	Collected with bomb sampler, in the canal behin the dam, prior to paper make
WS-01	MAFW08 (I) AJJ87 (O)	1115	Grab/3 to 4 feet	Collected with bomb sample from the lagoon, sampled from the catwalk, just before outfall from the lagoon
WS-02	MAFW09 (I) AJJ88 (O)	1630	Composite/24 hour	Collected by composite sampling system in place a Rock-Tenn Company; sample collected from a pip discharging from the lagoo
EB-WS	MAFW17 (I) AJJ97 (O)	0900	Grab	Effluent/surface water sampling equipment rinsate for QC of decontamination procedures

I = RAS Inorganic Analysis

O = RAS Organic Analysis

[8,38,39]

Tables 5 and 6 are summaries of compounds and analytes detected in the CLP analysis of the source samples. For each sampling location, a compound or analyte is listed if it was detected at least three times greater than the reference sample concentration. The background sample concentrations (SS-01 for soil samples and SW-01 for lagoon samples) are established as the reference concentrations. Compounds or analytes that occur at a concentration at least three times greater than the reference concentration are designated by their approximate relative value above the reference concentration. If the analyte or compound is not detected in the reference sample, the reference sample quantitation limit (SQL) (for organic analyses) or sample detection limit (SDL) (for inorganic analyses) is used as a reference value. Accordingly, compounds or analytes are listed by their approximate concentration above the SQL or SDL only if they occur at a value equal to or greater than the reference sample's SQL or SDL.

The complete analytical results of the CDM source sampling activities, including quantitation and detection limits, are presented in Attachments A (Organic Analytical Results) and B (Inorganic Analytical Results). Sample results qualified with a "J" on the analytical tables are considered approximate because of limitations identified during the CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits, and confirmed by mass spectrometry, are also qualified by a "J" and are considered approximate.

TABLE 5

Summary of Analytical Results
Landfill Source Sample Analysis for
Boise Cascade/North Landfill/Lagoon

Sample Location No.	Compound/Analyte	Concentration	Reference Concentration	Comments
SS-02	Calcium	4,830 mg/kg	615 mg/kg	7.85 x REF
	Magnesium	7,500 mg/kg	1,460 mg/kg	5.14 x REF
	Nickel	38.1 mg/kg	7.5 mg/kg	5.1 x REF
	Potassium	1,930 mg/kg	386 mg/kg	5.00 x REF
SS-03	Calcium	6,030 mg/kg	615 mg/kg	9.80 x REF
	Magnesium	7,310 mg/kg	1,460 mg/kg	5.01 x REF
	Nickel	34.6 mg/kg	7.5 mg/kg	4.6 x REF
	Potassium	1,710 mg/kg	386 mg/kg	4.43 x REF
SS-04	Methylene chloride	240 J μg/kg	14 U μg/kg	17 x SQL
	Phenanthrene	4,800 J μg/kg	460 U μg/kg	10 x SQL
	Anthracene	1,200 J μg/kg	460 U μg/kg	2.6 x SQL
	Carbazole	880 J μg/kg	460 U μg/kg	1.9 x SQL
	Fluoranthene	9,900 μg/kg	* 460 U μg/kg	22 x SQI.
	Pyrene	7,400 μg/kg	* 460 U μg/kg	l6 x SQL
	Benzo(a)anthracene	5,000 J μg/kg	460 U μg/kg	11 x SQL
	Chrysenc	5,300 J μg/kg	460 U μg/kg	12 x SQL
	bis(2-ethylhexyl)phthalate	1,700 J μg/kg	460 U μg/kg	3.7 x SQL

TABLE 5 (continued)

Sample Location No.	Compound/Analyte	Concentration	Reference Concentration	Comments
SS-04	Benzo(b)fluoranthene	6,300 μg/kg	460 U μg/kg	14 x SQL
continued	Benzo(k)fluoranthene	2,100 J μg/kg	460 U μg/kg	4.6 x SQL
	Bcnzo(a)pyrene	4,000 J μg/kg	460 U μg/kg	8.7 x SQL
į	Indeno(1,2,3-cd)pyrene	3,500 J μg/kg	460 U μg/kg	7.6 x SQL
	Dibenz(a,h)anthracene	700 J μg/kg	460 U μg/kg	1.5 x SQL
	Benzo(g,h,i)perylene	2,400 J μg/kg	460 U μg/kg	5.2 x SQL
	Endrin ketone	61 J μg/kg	4.6 U μg/kg	13 x SQL
	Aroclor-1254	140 J μg/kg	4.6 U μg/kg	30 x SQL
	Calcium	7,360 mg/kg	615 mg/kg	12.0 x REF
	Copper	119 mg/kg	28.2 mg/kg	4.22 x REF
	Lead	118 mg/kg	31.5 mg/kg	3.75 x REF
	Zinc	236 mg/kg	40.9 mg/kg	5.77 x REF
	Cyanide	1.8 mg/kg	0.66 U mg/kg	2.7 x SDL

REF = Reference concentration.

SDL = Sample Detection Limit.

SQL = Sample Quantitation Limit.

J = Quantitation approximate due to limitations identified in quality control review.

U = Indicates the sample was analyzed but not detected and reports the detection value.

mg/kg = Milligrams per kilogram.

 $\mu g/kg = Micrograms per kilogram.$

* = Fluoranthene and pyrene were detected in the background sample at estimated values below the SQL. Only the SQL is reported in the above table.

Note: The precision of the entries in "Comments" column is governed by the rules of significant digits.

[38,39]

Analytical results indicate the presence of contaminants at levels greater than the SQL or SDL or exceeding three times the reference sample in surface soils at the Boise Cascade/NLL, including VOCs, SVOCs, and metals [38,39]. Source samples were collected in targeted areas surrounding the landfill. The only VOC detected in soil samples, methylene chloride, has previously been detected in sludge samples. Use of methylene chloride at the paper mill is not documented. Methylene chloride is a common laboratory contaminant; it was detected in the soil sampling equipment blank [38]. SVOCs detected in soil samples include PAHs. PAHs are not known to be associated with the paper mill process. The reason for their presence in soil samples collected at the landfill is not known. Previous sludge sample analysis has not included PAH analysis [2,37,53]. A pesticide, endrin ketone, was detected in SS-04 at a concentration 13 times greater than the reference concentration [38]. Pesticides are not known to be associated with Boise Cascade/NLL; the presence of endrin ketone is likely due to routine application of pesticides in the area of Sheldon Springs prior to 1972. In 1972, EPA banned the use of pesticides; however, due to their persistant nature, they may be present at low concentrations. A PCB, Aroclor-1254, was detected at SS-04, at a concentration 30 times greater than the background concentration [38]. The origin of this PCB is unknown. In addition to the TCL substances detected, as many as 24 additional organic compounds were tentatively identified in the surface soil samples [38]. Inorganics detected in soil samples include calcium, copper, lead. magnesium, nickel, potassium, zinc, and cyanide [39]. Concentrations of these substances are generally less than 10 times the concentration in the background sample. These substances are believed to have been present in the sludge deposited in the landfill before 1974. Copper, lead, nickel, zinc, and cyanide were also detected in sludge samples collected in 1985 [2,37,53].

TABLE 6

Summary of Analytical Results

Lagoon Source Sample Analysis for Boise Cascade/North Landfill/Lagoon

Sample Location No.	Compound/Analyte	Concentration (µg/l)	Background Concentration (µg/l)	Comments
WS-01	Acetone	130	10 U	13 x SQL
	Calcium	145,000	16,900	8.58 x REF
	Mercury	0.5 J	0.2 U	2.5 x SDL
	Sodium	101,000	4,840	20.9 x REF
WS-02	Calcium	148,000	16,900	8.78 x REF
	Sodium	104,000	4,840	21.5 x REF

SQL = Sample Quantitation Limit

SDL = Sample Detection Limit

REF = Reference Concentration

J = Quantitation approximate due to limitations identified in quality control review.

U = Indicates the sample was analyzed but not detected and reports the detection value.

 $\mu g/l = Micrograms per liter$

Note: The precision of the entries in "Comments" column is governed by the rules of significant digits.

[38,39]

Analytical results indicate the presence of one VOC and three inorganics in the lagoon samples at levels greater than the SQL or SDL or exceeding three times the reference sample (the river water sample). Acetone and mercury were not detected in the reference sample; the concentrations detected were 13 and 2.5 times the SQL and SDL, respectively. Calcium and sodium were detected in the reference sample. The concentrations of calcium and sodium in the effluent samples were approximately 8 and 21 times, respectively, greater than the concentration of these substances in the river sample. No SVOCs, pesticides, or PCBs were detected significantly above reference concentrations [38,39]. In addition to the TCL substances detected more than 20 additional organic compounds were tentatively identified in the waste stream samples [38]. Differences between WS-01 and WS-02 may be due to differences in collection methods or to differences in the constituents of wastestream over the times of collection. WS-01 was a grab sample collected by CDM. WS-02 was a composite sample collected by Rock-Tenn [8,9].

GROUNDWATER PATHWAY

The overburden in the landfill and lagoon area is described in the geological literature as pebbly marine sands. These deposits have been altered into loamy fine sands. Both of these soils are described as having high permeability and a seasonally high water table (less than twenty feet beneath the surface). Local well logs indicate that in Sheldon Springs the depth to water table ranges from 19 to 75 feet [37].

Bedrock underlying the Sheldon area consists of massive buff to gray quartzite, fractured dolomite, slate and conglomerate. The village of Sheldon east of the facility is underlain by a fractured schist-phyllite [37].

A review of the surficial geology, bedrock geology, and local well logs indicates that low permeability layers are horizontally discontinuous. Stratigraphy and design specifications for Sheldon Springs well No. 1 were not recorded. The well log for the Sheldon Springs well No. 2 lists 110 feet of clay between the bedrock and the overburden aquifers. This well is located approximately 1900 feet south of Well No. 1. This clay layer is not listed in other well logs from the Sheldon area [37].

Depth to bedrock is not documented. Bedrock outcrops are visible approximately 400 feet west of the lagoon [8,37]. Bedrock at Sheldon Springs Town Well No. 2, located 0.4 mile, or approximately 2,000 feet, south-southeast of Boise Cascade/NLL, is at a depth of approximately 150 feet bgs [31]. Regional groundwater flow direction is presumed to be to the north toward the Missisquoi River.

Groundwater quality throughout Vermont, including in the vicinity of Boise Cascade North, is class III [5]. Class III is defined as suitable for use as individual domestic water supplies [12].

Sheldon Springs formerly was supplied drinking water from a groundwater well located 100 feet southwest of the lagoon. This well was closed in 1986 due to the threat of contamination from the lagoon and the north landfill [37]. A trace (less than 1 µg/l) of PCP was detected in the well prior to its closure [33]. However, those results have since been questioned. Water quality analyses prior to 1986 lacked quality assurance/quality control (QA/QC) measures and information. Generally, the data produced before 1987 did not include blanks, spikes, or other checks. EPA had no approved analytical method for the detection of PCP and therefore no standard method was used [28,33]. Before 1985, the Boise Cascade paper mill process required the addition of PCP, which ended up in the wastewater stream [37,62]. Sludge samples collected from the primary clarifier in 1985 were analyzed for PCP and detected PCP at 155 mg/kg on a dry weight basis (previously reported as 34 mg/kg wet weight basis) [37,53]. This sludge may or may not be similar to that which was disposed of to the landfill before 1974. Contaminants present in the sludge may be indicative of contaminants present in the lagoon [37].

The village of Sheldon Springs is currently served drinking water by a bedrock groundwater well (Town Well No. 2). This is the nearest identified well. The total depth of this well is 203 feet, extending through subsurface materials, including 110 feet of clay and 57 feet of limestone bedrock [31]. Town Well No. 2 currently supplies drinking water to approximately 80 connections [17,55]. The 80 connections are estimated to include 78 residences (population = 78 x 2.8 = 218), Sheldon Springs Elementary School (population=390), and the Rock-Tenn mill

(population=142), for a total service population of 750 [8,17,26,55]. Semi-annual monitoring is being performed by Boise to attempt to detect any contamination of the town well from Boise Cascade South Landfill [4].

The village of Sheldon, Vermont, is supplied drinking water by an overburden groundwater well. This well is located 1.9 miles southeast of Boise Cascade/NLL and serves approximately 300 people [17,55]. The village of East Highgate is served drinking water by a groundwater spring located 1.2 miles northwest of Boise Cascade/NLL. This spring serves a population of 50 [55]. There is a groundwater supply proposed at Green Mountain Estates in Highgate, which would serve approximately 68 people [55]. All of these wells have wellhead protection areas [56]. There are no other public groundwater supplies within 4 miles of Boise Cascade/NLL [55]. Table 7 summarizes information about public groundwater supply sources within 4 miles of Boise Cascade/NLL.

TABLE 7

Public Groundwater Supply Sources within 4 Miles of Boise Cascade/North Landfill/Lagoon

Distance/ Direction from Property	Source Name	Location of Source	Estimated Population Served	Source Type
0.4 mile SSE	Sheldon Springs Well No. 2	Sheldon Springs	750	Bedrock
1.2 mile NW	East Highgate Spring	East Highgate	50	Spring
1.9 mile SE	Sheldon Village Well	Sheldon	300	Overburden
2.8 mîle W	Green Mountain Estates*	Highgate	68	Overburden

*Proposed [17,55]

Table 8 summarizes all drinking water populations served by groundwater sources located within each of the target distance rings within 4 miles. Frost Associates estimated the population served by private wells by summing the total number of drilled and dug wells within each CENTRACTS block (a Cartesian data management system used by the Census Bureau) and multiplying this total by the average number of people in each household. There are approximately 2.8 people per household in Sheldon Springs [30]. The location of the nearest well is not documented; however, according to the town clerk in Sheldon, all residences within 0.25 mile are served by the town water supply [20,52]. Frost Associates reports that approximately 4 people are served by private wells within 0.25 mile of Boise Cascade/NLL. The discrepancy between the Frost Associates report and that of the Sheldon town clerk indicates that the Cartesian system used by Frost Associates, and the radial system used to calculate the number of people within each ring, are not comparable. The private drinking water populations

within 0.25 mile of Boise Cascade/NLL, as documented by Frost Associates, have therefore been added to the 0.25 to 0.50-mile distance ring. The use of private wells located 0.25 to 0.75 mile southwest of the property has been documented [20,21,22,30,57]. Approximately 2,200 people are served drinking water by groundwater sources within 4 miles of Boise Cascade/NLL [30].

TABLE 8

Estimated Drinking Water Populations Served by Groundwater Sources within 4 Miles of Boise Cascade/North Landfill/Lagoon

Radial Distance From Boise Cascade/NLL (miles)	Estimated Population Served by Private Wells	Estimated Population Served by Public Wells	Total Estimated Population Served by Groundwater Sources Within the Ring
0.00 - 0.25	0	0	0
> 0.25 - 0.50	17	750	767
> 0.50 - 1.00	52	0	52
> 1.00 - 2.00	290	350	640
> 2.00 - 3.00	525	0*	525
> 3.00 - 4.00	685	0	685
TOTAL	1,569	1,100	2,669

^{*} Proposed Green Mountain Estates well population not included. [17,30,55]

In 1991, Conestoga, Revere & Associates (CR&A) installed a shallow monitoring well for Rock-Tenn as part of a Phase I/II Limited Site Assessment. This well was installed between the north landfill and the Rock-Tenn (then Specialty Paperboard, Inc.) lagoon. The soils in the boring were dry to 13 feet bgs, where a sand and gravel stratum was encountered. The static water level in this well was 4.5 feet below the top of the casing or roughly 2.5 feet bgs. The well was sampled by CR&A for priority pollutant organics, metals, and typical landfill parameters. Only iron was detected above secondary drinking water standards [11]. Complete laboratory analytical results were not made available to CDM.

On November 15, 1994, CDM collected groundwater samples (GW-01 and GW-02) from this monitoring well (see Figure 4) [8]. Both groundwater samples were collected using a bailer and were submitted for TAL and TCL analysis via RAS. A summary of groundwater samples collected by CDM is shown in Table 9. While CDM had planned to collect a sample from the former Sheldon Springs Well No. 1, the physical condition of the well prevented collection of a sample [8]. The omission of this sample is a deviation from the Task Work Plan [9].

TABLE 9 Sample Summary: Boise Cascade/North Landfill Lagoon Groundwater Samples Collected by CDM on November 15, 1994

Sample Location No.	CDM Sample #/ Traffic Report #	Time (hrs)	Remarks/ Sample Depth	Sample Source
GW-01	MAFW10 (I) AJJ89 (O)	1515	Grab	Monitoring well installed for Rock-Tenn; located 35 feet south of the Missisquoi River and 5 feet cast of the Rock-Tenn fence
GW-02	MAFW11 (I) AJJ90 (O)	1515	Grab	Duplicate of GW-01 for QC
EB-GW	MAFW16 (I) AJJ96 (O)	1410	Grab	Groundwater sampling equipment (bailer) rinsate; for QC of decontamination procedures

= RAS Inorganic Analysis 0

= RAS Organic Analysis

[8,38,39]

Table 10 is a summary of compounds and analytes detected in the analyses of GW-01/02. Only GW-02 results are reported because the same list of substances were detected in both samples; GW-02 generally showed slightly higher concentrations. All substances detected above the SDL or SQL are presented. No background sample was collected for reference [8]. Contract required detection limits (CRDLs) and MCLs for the substances detected are also reported in Table 10.

The complete analytical results of the CDM sampling activities, including SQLs and SDLs, are presented in Attachment A and Attachment B. Sample results qualified with a "J" on the analytical tables are considered approximate because of limitations identified during the CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits, and confirmed by mass spectrometry, are also qualified by a "J" and are considered approximate.

TABLE 10

Summary of Analytical Results Groundwater Sample Analysis for Boise Cascade/North Landfill/Lagoon

Sample Location No.	Compound/ Analyte	Concentration (µg/l)	CRDL (μg/l)	MCL (μg/l)
GW-02	Aluminum	18,800	200	NE
	Barium	125	200	2,000
	Beryllium	1.0	5	4
	Calcium	17,100	5,000	NE
	Chromium	74.5	10	100
	Cobalt	23.8	50	NE
	Copper	90.6	25	1,300
	Iron	31,900	001	NE
	Lead	38.8	3	15**
	Magnesium	15,100	5,000	NE
	Manganese	1,690	15	NE
	Nickel	102	40	100
	Potassium	4,810	5,000	NE
	Sodium	8,880	5,000	NE
	Vanadium	44.9	50	NE
	Zinc	136	20	NE

MCL = Maximum Contaminant Level CRDL = Contract Required Detection Limit

 $\mu g/l$ = Micrograms per liter NE = None established ** = Action Level

[38,39,47]

Analytical results indicate the presence of contaminants at concentrations greater than the SQL or SDL; however, there is no background sample available for comparison. Contaminants detected above the SDL in samples from the monitoring well include inorganics; no VOCs, SVOCs, pesticides, or PCBs were detected above SQLs in GW-01/02 [38,39]. Of the 16 inorganics detected above the SDL in the monitoring well, calcium, copper, lead, magnesium, nickel, potassium, sodium, and zinc were detected in source samples collected by CDM, and aluminum, barium, beryllium, chromium, cobalt, iron, manganese, and vanadium were not detected in source samples [39].

Only one of the contaminants detected in the onsite wells was at a concentration exceeding the MCL for that contaminant; nickel was detected at a concentration of $102~\mu g/l$, above the MCL of $100~\mu g/l$. Additionally, lead was detected at $38~\mu g/l$, above the action level of $15~\mu g/l$ [38,39,47]. Concentrations of contaminants in the monitoring well samples greatly exceeded some Secondary MCLs (SMCLs) (given in parentheses), including aluminum ($50~\mu g/l$), iron ($300~\mu g/l$), and manganese ($50~\mu g/l$) [38,39,58]. The concentrations of barium, copper, sodium, and zinc detected are well below the 2,000 $\mu g/l$ MCL, 1,300 $\mu g/l$ MCL, 250,000 $\mu g/l$ SMCL, and 5,000 $\mu g/l$ SMCL, respectively [38,47,58].

SURFACE WATER PATHWAY

Boise Cascade/NLL is located in the Missisquoi River watershed. Soil types identified in the area of Boise Cascade/NLL are of the Tunbridge/Woodstock, Deerfield, and Au Gres series. The lagoon area is identified as primarily Tunbridge/Woodstock (fine sandy loams, very rocky, excessively drained), and Deerfield (loamy fine sand, well drained). The landfill area is identified as predominantly Au Gres series (loamy fine sand, poorly drained) [43]. Portions of the landfill are within the 100- and 500-year floodplain. The lagoon is outside of the 500-year floodplain [29].

Overland flow from the northern section of Boise Cascade/NLL drains to the Missisquoi River. Areas in the southern section of Boise Cascade/NLL drain to low-lying areas between the two properties. The eastern portion of the landfill drains to a ditch located on the eastern property line. This ditch also collects drainage from the adjacent farm land and then discharges to the Missisquoi River at the eastern edge of the landfill property line. The most upstream probable point of entry (PPE) for overland flow to enter the surface water pathway is where this drainage ditch meets the Missisquoi River. However, PPEs are also present along the northern border of the properties [8,52]. The 15-mile surface water pathway extends from the most upstream PPE in the Missisquoi River to a point on the river 15 miles downstream [50,51,52].

Surface water quality classification in the Missisquoi River is class B. Class B waters are targeted to achieve and maintain a high level of quality for aesthetics and aquatic habitats, as well as to be used as a public water supply with filtration and disinfection, swimming, and recreation [61]. The Missisquoi River, below the Sheldon Springs dam, is used for all types of recreation [59].

The mean annual flow rate of the Missisquoi River is gauged by the U.S. Geological Survey (USGS) at a gauging station located approximately 15 miles downstream of Sheldon Springs. At this location, the mean annual flow rate is 1,577 cubic feet per second (cfs) [49]. Based on the drainage basin area for the Mississquoi River, calculated at the Sheldon Springs dam, the flow rate is estimated to be 1,657 cfs [13]. Table 11 summarizes information about the 15-mile downstream pathway.

TABLE 11
Water Bodies within the Surface Water Segment of
Boise Cascade/North Landfill Lagoon

Surface Water Body	Descriptor*	Length of Reach	Flow Characteristics (cfs) ^h	Length of Wetlands
Missisquoi River	Moderate to large stream	15 miles	< 1,577	5 miles

Minimal stream. Small to moderate stream. Moderate to large stream. Large stream to river. Very large river. Coastal tidal waters. Shallow ocean zone or Great Lake. Deep ocean zone or Great Lake. Three-mile mixing zone in quiet flowing river.

b Cubic feet per second.

[13,37,44,49]

There are no drinking water intakes along the Missisquoi River [14]. The dam at Sheldon Springs was redeveloped for hydropower use in the late 1980s and is operated by Missisquoi Associates [8,18]. The hydroproject diverts water at the Sheldon Springs dam, carrying it through a bypass where it discharges approximately 1 mile downstream of the dam [1,19]. The hydroproject allows a minimum volume of flow through the river section adjacent to the Rock-Tenn mill to support the spawning of walleyed pike in the rapids section below the dam [16].

Along the 15-mile downstream pathway are primarily warm-water fisheries. Sport fishing includes smallmouth bass, walleye, and occasional brown trout [16,18,25]. Brown trout are stocked in the Missisquoi River, upstream of Sheldon Springs, in the area of Berkshire/Richford [60]. According to officials of the Vermont Department of Fish and Wildlife and local officials, fishing has been observed in the vicinity of the Rock-Tenn Mill, particularly at rapids below the dam and upstream of the hydropower bypass, as well as at least one sighting of a fisherman from the bridge just upstream of the dam [1,17,19,25]. Fishing may also occur from both shorelines of the Missisquoi River in the vicinity of the north landfill and lagoon [8,17].

Along the 15-mile downstream pathway are habitats for two state designated threatened species [15,34]. There are approximately 5 miles of wetland frontage on the 15-mile surface water pathway. The closest wetlands to Boise Cascade/NLL are 1.25 miles from the most upstream PPE [44].

Prior to this SIP, no sampling of the Missisquoi River had been performed in association with work performed at Boise Cascade/NLL [37]. On November 15, 1994, CDM collected sediment samples from the Missisquoi River, adjacent to Boise Cascade/NLL [8]. A summary of all sediment samples collected by CDM is shown in Table 12. All samples were collected at a depth of 0 to 12 inches. One background sample (SD-01), which is presumed to be unaffected by any sources, was collected from the river adjacent to farmland 25 feet upstream of the PPE. All samples were collected from the southern shore of the Missisquoi River except SD-05, which, due to sloping bedrock on the southern shoreline, had to be collected from the northern shoreline [8]. This was a deviation from the Task Work Plan. Figure 4 shows the approximate sample locations. All samples were analyzed for full TCL and TAL through EPA CLP [38,39].

TABLE 12

Sample Summary: Boise Cascade/North Landfill/Lagoon
Sediment Samples Collected by CDM on November 15, 1994

Sample Location No.	CDM Sample #/ Traffic Report #	Time (hrs)	Remarks/ Sample Depth	Sample Source
SD-01	MAFW01 (I) AJJ80 (O)	1545	Grab/0 to 12 inches	Approximately 25 feet upstream from the eastern property boundary; approximately 5 feet from the southern shoreline
SD-02	MAFW02 (I) AJJ81 (O)	1445	Grab/0 to 12 inches	10 feet east of the Rock- Tenn Company fence, 18 inches from the southern shoreline
SD-03	MAFW03 (I) AJJ82 (O)	1445	Grab/0 to 12 inches	Duplicate of SD-02 for QC
SD-04	MAFW04 (I) AJJ83 (O)	1400	Grab/0 to 12 inches	Approximately 50 feet west of the lagoon pumphouse, 6 feet from the southern shoreline
SD-05	MAFW05 (I) AJJ84 (O)	1310	Grab/0 to 12 inches	Northern shore of the river; approximately 50 feet upstream of the bridge, 18 inches from the northern shoreline
EB-SD	MAFW15 (I) AJJ95 (O)	0845	Grab	Sediment sampling equipment rinsate; for QC of decontamination procedures

I = RAS Inorganic Analysis
O = RAS Organic Analysis
[8,38,39]

Table 13 is a summary of compounds and analytes detected in the CLP analysis of the sediment samples. For each sampling location, a compound or analyte is listed if it was detected at least three times greater than the reference sample concentration. The background sample concentrations (SD-01) are established as the reference concentrations. Compounds or analytes that occur at a concentration at least three times greater than the reference concentration are designated by their approximate relative value above the reference concentration. If the analyte or compound is not detected in the reference sample, the reference SQL (for organic analyses) or SDL (for inorganic analyses) is used as a reference value. Accordingly, compounds or analytes are listed by their approximate concentration above the SQL or SDL only if they occur at a value equal to or greater than the reference sample's SQL or SDL.

The complete analytical results of the CDM sediment sampling activities, including quantitation and detection limits, are presented in Attachments A and B. Sample results qualified with a "J" on the analytical tables are considered approximate because of limitations identified during the CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits, and confirmed by mass spectrometry, are also qualified by a "J" and are considered approximate.

TABLE 13

Summary of Analytical Results Sediment Sample Analysis for Boise Cascade/North Landfill/Lagoon

Sample Location No.	Compound/Analyte	Concentration (mg/kg)	Background Concentration (mg/kg)	Comments
SD-03	Соррет	19.2 J	16.1 UJ	1.19 x SDL

SDL = Sample Detection Limit

J = Quantitation approximate due to limitations identified in quality control review

UJ = The sample detection limit is an estimated value

mg/kg = Milligrams per kilogram

[38,39]

Analytical results indicate that copper is the only substance detected above reference concentrations in the Missisquoi River. Copper was detected in a surface soil sample at the landfill at a concentration of 119 mg/kg [38,39]. Copper was also detected in 1985 sludge samples. As many as 24 additional (non-TCL) organic compounds were identified in the sediment samples [38].

SOIL EXPOSURE PATHWAY

The landfill was closed in 1974 with 2 feet of sludge and bark cover, topped with topsoil and seed [10]. On CDM's reconnaissance, the field team walked the properties encompassing the lagoon and landfill. The landfill area supports a large amount of vegetation. Because of the heavy vegetation, access to the landfill is restricted. The landfill is bordered to the east and west by a fence. One area of paper sludge remnants was noted along the old railroad bed [8]. There is no known human use of the landfill area. CDM performed sampling of surficial soils in the landfill area (see Figure 4). Results of these samples (SS-01 through SS-05) are reported in Table 5 in the Waste/Source Sampling section. Contaminants detected in surficial soil samples include methylene chloride, PAHs, endrin ketone, Aroclor-1254, calcium, copper, lead, magnesium, nickel, potassium, zinc, and cyanide [38,39]. See Attachments A and B for complete analytical results.

The lagoon has been in operation on the property since at least 1970. The lagoon is enclosed by a perimeter fence that has one gate open only during daytime hours of operation [8,37]. CDM performed sampling of the lagoon contents. Results of these samples (WS-01/02) are reported in Table 6 in the Waste/Source Sampling section. Contaminants detected in the lagoon include acetone, calcium, mercury, and sodium [38,39]. See Attachments A and B for complete analytical results.

Rock-Tenn employs 142 people at the mill; approximately 3 employees are associated with the lagoon area [8]. Eight private residences border the property, approximately 50 feet to the west of the lagoon [8,52]. No residences are on the Boise Cascade/NLL property. No schools or day-care facilities are on the property or within 200 feet from any area of observed contamination [52]. No terrestrial sensitive environments are known to be on the property [15,34]. An estimated 141 people live within a 1-mile radius of the landfill [30].

AIR PATHWAY

The nearest individuals to the Boise Cascade/NLL are the Rock-Tenn employees who work at the wastewater treatment plant area. Rock-Tenn employs 142 people at the mill; approximately 3 employees are associated with the lagoon area [8]. The nearest school is the Sheldon Springs Elementary School, located approximately 0.5 mile south of Boise Cascade/NLL [52]. The school has a student population of 350, plus a staff of 40 [26]. Population within 4 miles of the property is estimated to be 2,596 [30]. No sensitive environments have been identified onsite [15,34]. Sensitive environments within 4 miles of the property include more than 1,100 acres of wetlands [44]. Additionally, within a 0.5-mile radius of Boise Cascade/NLL, there are habitats for two state designated threatened species; there are no other identified threatened or endangered species within 4 miles of Boise Cascade/NLL [15,34]. CDM did not document the number of people attending schools or working within 4 miles of Boise Cascade/NLL.

Table 14 presents the residential population within 4 miles of the property by distance ring.

TABLE 14

Estimated Population within 4 Miles of Boise Cascade/North Landfill/Lagoon

Radial Distance From Boise Cascade North (miles)	Estimated Population
0.00 - 0.25	9*
> 0.25 - 0.50	27
> 0.50 - 1.00	105
> 1.00 - 2.00	512
> 2.00 - 3.00	847
> 3.00 - 4.00	1,096
TOTAL	2,596

^{*} A house count refutes U.S. Census Bureau information; eight residences bordering the lagoon immediately to the west implies that the population within 0.25 mile is larger than 9. [30,52]

No air sampling was conducted at the Boise Cascade/NLL in conjunction with this SIP. While conducting field activities, CDM monitored ambient air quality using an organic vapor monitor (OVM). No OVM readings above background (0.0 ppm) were registered by the OVM during the sampling event. The background reading during the onsite reconnaissance was also 0.0 ppm. The highest OVM reading recorded during the onsite reconnaissance was 0.7 ppm, which was recorded while touring the Rock-Tenn Mill. This reading was obtained in an area near operating equipment and a forklift [8].

SUMMARY

Boise Cascade/North Landfill/Lagoon (Boise Cascade/NLL) is located on Mill Street in Sheldon Springs, Franklin County, Vermont. A paper mill complex located in Sheldon Springs has been operating since 1955 under many different owners/operators. Over the years, the complex has encompassed the paper mill, the wastewater treatment system, and two landfills. The subject of this Site Inspection Prioritization (SIP) is the industrial landfill used from 1955 to 1974 (known as the north landfill or old landfill) and the active wastewater treatment aerated lagoon. Therefore, Boise Cascade North is divided into two portions: the landfill property, owned by Boise Cascade Corporation (Boise), and the lagoon property, owned and operated by Rock-Tenn Company (Rock-Tenn). The landfill property is an estimated 14 acres; the landfill covers less than the full property size. The lagoon volume is estimated to be 6.1 million cubic feet.

Saxon Industries (Saxon) operated the entire complex from 1955 to 1983. The north landfill, operated from 1955 to 1974, was closed in 1974 and a new landfill (the south landfill) was created. The south landfill is also a property listed in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Information System (CERCLIS), known as Boise Cascade South Landfill (VTD095247185). In 1983, Boise purchased the entire complex, including the two landfills, and proceeded to close the south landfill. Boise reportedly did not deposit any materials into either of the landfills. The mill complex, defined as the mill and the wastewater treatment system, has since changed ownership two more times. However, Boise has retained ownership of the properties encompassing the two landfills. In 1989, Boise sold the mill complex to Specialty Paperboard, Inc. In March 1993, Rock-Tenn purchased the mill complex and currently operates the mill as a 100 percent recycled fiber paper mill.

The landfill was used for general solid waste produced by the paper mill operations as well as paper sludge from the wastewater treatment plant. The closure was approved by the Vermont Agency of Environmental Conservation (VTAEC) to include 2 feet of sludge and bark cover with topsoil and seed. The lagoon was completed in 1974 to provide secondary treatment of the paper mill wastewater. An underdrain system exists beneath the lagoon to collect and recycle any discharge from leakage through the liner.

Saxon originally obtained a National Pollutant Discharge Elimination System (NPDES) permit in 1974 for discharge to the Missisquoi River. Discharges included sanitary waste, river water used for power generation, cooling water, industrial wastewater from the wastewater treatment system, and the sand filter backwash. The current NPDES permit covers discharge of wastewater from the wastewater treatment system and cooling water from a condensor for turbines.

In November 1985, a leak in the liner of the lagoon allowed the lagoon contents to bypass the underdrain system and possibly to come into contact with the underlying overburden. Effluent was also discharged to the Missisquoi River. Following the rupture, the Vermont Department of Health tested both Sheldon Springs Wells No. 1 and No. 2. No contamination due to the lagoon leak was detected. The threat of contamination from the lagoon leak to the Sheldon Springs wells, located 100 feet southwest and 2,000 feet southeast of the lagoon respectively, prompted Boise officials and the Vermont Department of Health to advise Sheldon Springs to close well No. 1 until testing was complete. In March 1986, the detection of a trace of

pentachlorophenol (less than 1 parts per billion [ppb]) in a groundwater sample from well No. 1 led to its shutdown.

Sludge samples from the wastewater treatment plant were analyzed in 1985. Acetone, chloroform, methylene chloride, toluene, pentachlorophenol, phenol, 2-butanone, arsenic, cadmium, copper, lead, nickel, and zinc were detected. These results may indicate that wastewater in the lagoon or the sludge placed into the landfill could provide a source for the PCP detected in the Sheldon Springs well No. 1.

On November 15, 1994, CDM field personnel collected five surface soil samples, five sediment samples, two groundwater monitoring well samples, and two lagoon samples from Boise Cascade/NLL. The purpose of the sampling event was to determine types and concentrations of hazardous substances onsite and to investigate migration of hazard substances from the site. All samples were submitted for full Target Compound List and Target Analyte List analysis through the EPA Contract Laboratory Program Routine Analytical Services.

Analytical results indicate the presence of contaminants at significant concentrations in the landfill and lagoon samples. Volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals were detected in the landfill. Acetone, calcium, mercury, and sodium were detected in the lagoon. In the groundwater samples, inorganics were detected at concentrations generally below Maximum Contaminant Levels (MCLs); nickel was detected slightly above the MCL and lead was detected above the federal action level. Copper was detected above reference concentrations in a sediment sample collected from the Missisquoi River.

A population of 300 in Sheldon Springs is served drinking water from a bedrock well located approximately 2,000 feet south southeast of Boise Cascade/NLL. This is the nearest public well. Other community groundwater systems within a 4-mile radius include the Sheldon village overburden well, serving 300 people, located 1.9 miles southeast; a spring in East Highgate, serving a population of 50, located 1.2 miles northwest. Each of these public water supplies has a wellhead protection area. The nearest private well is more than 0.25 mile from Boise Cascade/NLL, although its location has not been identified. An estimated 2,219 people are served drinking water from groundwater sources within 4 miles of the Boise Cascade NLL.

Overland flow generally drains from Boise Cascade/NLL to the Missisquoi River. Areas in the southern section of Boise Cascade/NLL drain to low lying areas between the two properties. The most upstream probable point of entry (PPE) for overland flow to enter the surface water pathway is where this drainage ditch meets the Missisquoi River, along the landfill's eastern property boundary. However, additional PPEs are located along the northern border of the properties. The 15-mile surface water pathway extends from the most upstream PPE in the Missisquoi River to a point 15 miles downstream in the river.

There are no drinking water intakes along the Missisquoi River. The dam at Sheldon Springs was redeveloped for hydropower use in the late 1980s and is operated by Missisquoi Associates. The hydroproject diverts water at the Sheldon Springs dam, carrying it through a bypass where it discharges approximately 1 mile downstream of the dam. The hydroproject allows a minimum volume of flow through the river section adjacent to the Rock-Tenn mill to support the spawning

of walleyed pike in the rapids section below the dam. Along the 15-mile downstream pathway are primarily warm water fisheries. Fishing has been observed in the vicinity of the Rock-Tenn Mill. Along the 15-mile downstream pathway are habitats for two state designated threatened species. There are approximately 5 miles of wetland frontage on the 15-mile surface water pathway.

Rock-Tenn employs 142 people at the mill; approximately 3 employees are associated with the lagoon area. There are no employees associated with the landfill. Eight private residences border the property, approximately 50 feet west of the lagoon. No schools or day-care facilities are on the property or within 200 feet from any area of observed contamination. No terrestrial sensitive environments are known to be on the property. An estimated 141 people live within a 1-mile radius of Boise Cascade/NLL. Access to the lagoon is restricted by a perimeter fence with a gate that is open during the hours of operation. The landfill area is restricted by dense vegetation and fences to the east and west.

Population within 4 miles of the property is estimated to be 2,596. No sensitive environments have been identified onsite. Sensitive environments within 4 miles of the property include more than 1,100 acres of wetlands and habitats for 2 state designated threatened species. The nearest school is the Sheldon Springs Elementary School, located 0.5 mile south of Boise Cascade/NLL, which has a student population of 350, plus a staff of 40.

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ATTACHMENT A

Boise Cascade/North Landfill/Lagoon

Organic Sample Analytical Results CDM Federal Programs Corporation

November 15, 1994 (sampling date)

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Water units are reported in ug/L. Soil units are reported in ug/Kg.

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TIME: 12:38

CADRE 1.92

SHELDON, VT EPA SAMPLE NUMBER: SAMPLE LOCATION: AJJ87 AJJ88 WS-02 AJJ89 GW-01 AJJ92 SW-01 AJJ94 WS-01 GW-02 LABORATORY SAMPLE NUMBER: EB-SS ⊌K1680-1 WK1680-2 WK1680-3 ₩X1680-4 WK 1680-5 SAMPLE TYPE: MATRIX/ANALYSIS: WK1680-6 Routine Sample Routine Sample Routine Sample Routine Sample Routine Sample iEquipment Blank WATER/LOW WATER/LOW WATER/LOW WATER/LOW WATER/LOW DILUTION FACTOR: WATER/LOW 1.0 1.0 1.0 11/15/94 1.0 1.0 DATE SAMPLED: DATE EXTRACTED: 11/15/94 11/18/94 11/15/94 11/18/94 12/01/94 11/15/94 11/15/94 11/15/94 11/18/94 11/18/94 11/18/94 11/21/94 11/18/94 DATE ANALYZED: 12/02/94 11/21/94 11/21/94 11/21/94 RNA Phenol 10 U 10 U 10 10 bis(2-Chloroethyl) ether U 10 U 10 10 10 10 10 н U 10 10 U 2-Chlorophenol 10 10 Ū 10 Ū Ų 10 10 Ù Ü 1,3-Dichlorobenzene 10 10 U 10 10 ū 10 10 ,4-Dichlorobenzene 10 10 10 10 10 Ū U ,2-Dichlorobenzene U 10 10 10 Ū 10 10 -Methylphenol Ü 10 10 U U U 10 10 U .2'-oxybis(1-Chloropropane) 10 UUU 10 10 10 10 10 H 4-Methylphenol 10 10 U 10 10 10 10 10 п N-Nitroso-di-n-propylamine 10 10 U 10 10 Ù Hexach Loroetnane UUUU 10 Ū 10 10 U 10 U 10 10 Ŭ Mitrobenzene Ū 10 ŭ 10 10 Ü 10 10 10 Ū Isophorone 10 iŏ ŭ 10 Ū 10 10 Ū 2-Nitrophenol 10 10 10 Ü 10 ŭ 10 UU 10 10 10 10 U ,4-Dimethylphenol U 10 10 10 bis(2-Chloroethoxy) methane U 1ō 10 Ù 10 2,4-Dichlorophenol 10 10 10 10 10 10 10 U 10 10 И 10 10 Ū Ü ,2,4-Trichlorobenzene 10 10 10 U 10 ū ŭ 10 10 U 10 Naphthalene UUU 10 U 10 ii U 10 10 10 Ū 4-Chioroaniiine U 10 Ū 10 10 υ Hexach Lorobutadiene 10 U 10 Ų 10 10 10 10 10 10 U 10 Ŭ 4-Chloro-3-methylphenol 10 Ũ U 10 İŌ Ū Ü 10 10 2-Methylnaphthalene 10 Ũ 10 10 kexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene Ŭ U 10 U U 10 10 25 10 25 10 10 10 10 25 10 U 10 25 10 25 10 U 10 Ū 10 25 10 25 10 Ū U 25 UU 10 2-Nitroaniline 25 10 25 10 10 25 10 10 U 25 10 Dimethylphthalate U U ŧ. Ũ Acenaphthylene 10 Ü 10 Ħ U 2,6-Dinitrotoluene 3-Nitroaniline u 10 10 25 10 25 10 10 П 10 10 25 10 25 25 25 10 Ū 10 25 10 25 25 10 10 U 25 10 25 25 10 Ū 25 10 25 25 10 ŭ Acenaphthene 10 ŧ. Ü U 2,4-Dinitrophenol U U 25 ШJ 25 25 10 ΠJ Ū Ū 4-Nitrophenol U U U Ū Dibenzofuran Ū 10 ü Ū UUU 2,4-Dinitrotoluene U 10 10 10 10 10 Ū 10 10 10 Diethylphthalate 10 10 Ū UUU 10 10 4-Chiorophenyi-phenyi ether 10 Ū 10 10 25 25 10 Ū 10 Ũ U 10 Fluorene Ū 10 25 U 10 25 25 10 10 25 25 10 UUU Ū 4-Nitroaniline 10 25 25 10 10 U 10 Ū Ũ U Ū 4,6-Dinitro-2-methylphenol Ü 25 U 25 Ŭ U Ū 25 10 Ŭ N-nitrosodiphenylamine U 10 U Ü 4-Bromophenyl-phenylether 10 U 10 Ū 10 10 25 10 10 Ū 10 Hexach Lorobenzene U 10 Ū 10 10 Ù 10 25 Ü U 10 25 10 10 10 25 Pentach Lorophenol U ŭ 25 10 25 1 U U υ U Phenanthrene U 90000 10 10 Ū Ŭ 10 Anthracene 10 10 U U Carbazole UUUUU 10 10 10 10 10 Di-n-butylphthalate 10 10 10 10 10 Fluoranthene 10 10 10 10 Ũ 10 U 10 10 Pyrene 10 U U Ŭ 10 10 Butylbenzylphthalate 3,31-Dichlorobenzidine 70 U 10 10 10 Ü 10 10 10 Ŭ U 10 10 10 ŭ U 10 10 10 ŭ Benzo(a)anthracene 10 U 10 10 U 10 10 2 10 10 Chrysene 10 10 ŭ 10 10 10 U 10 U 10 Ū bis(2-Ethylhexyl)phthalate U 10 U 10 10 U 10 10 Di-n-octylphthalate 10 U 10 ŪJ ÚJ 10 10 10 10 Benzo(b) fluoranthene U 10 10 U ŲJ 10 10 10 U.J 10 10 Ð 10 ū Benzo(k)fluoranthene 10 U IJ UJ Ū Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene U 10 Ū 10 10 U 10 IJ 11.1 10 ū tō 10 10 10 ŪĴ UJ 10 10 ŭ Ш 10 10 10 ÜĴ 10 UJ 10 10 П Benzo(g,h,i)perylene 10 10 10 UJ 10

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Water units are reported in ug/L. Soil units are reported in ug/Kg.

DATE: 12/28/94

TIME: 12:36

FILENAME: AJJ87.SDG

SERVICE HAMENIE HAME (SIS SITE: BOISE CASCADE NORTH CASE NO: 22928 SHELDON, VT SDG ND: AJJ87 LABORATORY: ABB ENVIRONMENTAL EPA SAMPLE NUMBER: AJJ95 EB-SD AJJ96 EB-GW |AJJ97 SAMPLE LOCATION: LABORATORY SAMPLE NUMBER: EB-WS WK1680-9 WK1680-7 ⊌K1680-8 SAMPLE TYPE: Equipment Blank Equipment Blank Equipment Blank MATRIX/ANALYSIS: WATER/LOW WATER/LOW DILUTION FACTOR: 1.0 1.0 DATE SAMPLED: DATE EXTRACTED: 11/15/94 11/18/94 11/15/94 11/15/94 11/18/94 11/18/94 DATE ANALYZED: 12/01/94 12/02/94 12/02/94 Phenol 10 bis(2-Chloroethyl) ether 10 Ū 10 U 2-Chlorophenol 10 UUU 10 10 Ü 1,3-Dichlorobenzene 1ŏ 1ŏ ,4-Dichlorobenzene 10 10 10 Ü 10 2-Dichlorobenzene Ü 10 10 10 10 2-Methylphenot 2,2'-oxybis(1-Chloropropane) 10 υ 10 10 Ū 10 Ü -Methylphenol 10 10 10 U Ŭ 10 10 10 N-Nitroso-di-n-propylamine Ü 10 10 10 10 Hexachloroethane UUU U Nitrobenzene ш 10 10 Isophorone Ш 10 10 10 10 10 10 10 2-Nitrophenol Ū Ü 10 Ū 10 10 2,4-Dimethylphenol 10 Ū bis(2-Chloroethoxy) methane Ū U 10 2,4-Dichlorophenol 10 U U 10 1,2,4-Trichlorobenzene 10 Ū u 10 Nachthallene ម ប ប 10 U 10 4-Chloroaniline 10 10 Hexach Lorobutadiene 10 10 10 Ū 4-Chloro-3-methylphenol 10 10 ŪUUU 2-Methylnaphthalene 10 10 10 10 25 10 25 10 10 U Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 10 U 10 Ü 10 25 10 25 10 Ü u 2-Chloronaphthalene ū П 2-Witroaniline П Ū υ Dimethylphthalate U ŭ Acenaphthylene ŭ 10 Ū 2,6-Dinitrotoluene U 10 25 10 25 25 10 U 10 3-Witroaniline U 25 10 25 10 10 10 10 10 25 10 Acenaphthene Ũ 2,4-Dinitrophenol ŲJ ŪĴ IJ 4-Nitrophenol Ù ū u Dibenzofuran U u 2,4-Dinitrotoluene 10 10 u U Diethylphthalate 1 10 10 25 25 10 Ŋ ŭ 4-Chlorophenyl-phenyl ether 10 U Fluorene U 10 25 25 10 ŭ 4-Nitroaniline Ū 4,6-Dinitro-2-methylphenol U Ŭ N-nitrosodiphenytamine Ū 4-Bromophenyl-phenylether 10 ŭ 10 10 Ū Hexach i probenzene 10 ŭ 10 10 Ū Pentachlorophenol 25 10 UUU 25 10 10 25 10 10 Ŭ Phenanthrene Anthracene Carbazole 10 Ū 10 Ð 10 Ū Di-n-butyiphthalate iŏ 10 10 U Fluoranthene 10 10 П U Pyrene 10 10 10 U 10 10 10 10 Ū Butylbenzylphthalate 10 10 10 U U Ü 3,3'-Dichlorobenzidine Ц 10 Benzo(a)anthracene 10 U Chrysene U 10 U bis(2-Ethylhexyl)phthalate 10 10 IJ Di-n-octylphthalate Benzo(b)fluoranthene U 10 10 u 10 10 ŭ

Water units are reported in ug/L. Soil units are reported in ug/Kg.

FILENAME: AJJ87.SDG DATE: 12/28/94

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TIME: 12:36

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Benzo(k)fluoranthene

Benzo(g,h,i)perylene

Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene

Benzo(a)pyrene

Disk: 7710023-DV06 File: 22928PAR.WK4

CLP PESTICIDE/PCB ORGANIC ANALYSIS CASE 22928, SDG AJJ87 AQUEOUS ANALYTICAL RESULTS (ug/L)

Table III Page 5 of 10

Sample Location		WS-01	WS-02	GW-01	GW-02	SW-01	EB-SS	EB-SD	EB-GW	EB-WS
Traffic Report Number		AJJ87	AJJ88	AJJ89	AJJ90	AJJ92	AJJ94	AJJ95	AJJ96	AJJ97
Remarks				 			Equip. Blk.	Equip. Blk.	Equip. Bik.	Equip. Blk.
Sampling Date		15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	
							15-1104-54	13-1404-94	15-NDV-94	15-Nov-94
Extraction Date		19-Nov-94	19-Nov-94	21-Nov-94	21-Nov-94	21-Nov-94	21-Nov-94	21-Nov-94	21-Nov-94	21-Nov-94
Analysis Date		25-Nov-94	26-Nov-94	26-Nov-94	26-Nov-94	26-Nov-94	26-Nov-94	26-Nov-94	26-Nov-94	26-Nov-94
Dilution Factor		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PESTICIDE/PCB COMPOUN	D CROL			<u> </u>	<u> </u>		<u> </u>			
Ipha-BHC	0.05	0 05 U	0.05 U	# 5 # 11						
eta-BHC	0.05	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05
elta-BHC	0.05	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05
amma-BHC (Lindane)	0.05	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 ป	0.05 U	0.05 U	0.05
eptachlor	0.05	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05
drin	0.05	0.05 U	0.05 U 0.05 U	0.05 U	0.05 U	0.05 U	0.05 ∪	0.05 ป	0.05 U	0.05
eptachlor epoxide	0.05	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05
ndosulian i	0.05	0.05 U	0.05 U	0.05 ป	0.05 U	0.05 U	0 05 U	0.05 U	0.05 U	0.05
ieldrin	0.10	0.10 U	0.10 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 ป	0.05 U	0.05
4'-DDE	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10
nin	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10
ndosulfan II	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0 10 U	0.10 ป	0.10
4'-DDD	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10
ndosulfan sulfate	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 บ	0.10 U	0.10 U	0.10
4'-DDT	0.10	0.10 U		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0 10
ethoxychlor	0.50	0.50 U	0.10 U 0.50 U	0.10 U 0.50 U	0.10 U	0.10 บ	0.10 U	0.10 U	0.10 U	0.10
ndrin ketone	0.10	0.10 U	0.10 U		0.50 U	0.50 ป	0.50 U	0.50 U	0.50 ป	0.50
ndrin aldehyde	0.10	0.10 U	0.10 U	0.10 U 0.10 U	0.10 U	0.10 ป	0.10 U	0.10 U	0.10 U	0.10
oha-Chlordane	0.05	0.05 U	0.05 U	0.10 U	0 10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10
mma-Chlordane	0.05	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05
xaphene	5.0	5.0 U	5.0 U		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05
oclor-1016	1.0	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0
oclor-1221	20	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0
oclor-1232	1.0	2.0 U	1.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20
octor-1242	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 0 U	1.0 U	1.0
oclor-1248	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0
oclor-1254	1.0	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0
oclor-1260	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	100	1.0 U	1.0 U	10
710. 1200	'.0	1.0 ()	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10

J - The associated numerical value is an estimated quantity.

U - The compound was not detected. The associated numerical value is the compound quantitation limit.

UJ - The compound was not detected. The compound quantitation limit is an estimated value.

R - The datum was rejected.

CRQL - Contract Required Detection Limit

SDG NO: AJJ74						L	SITE: ABORATORY:	BOISE	CASCADE A	ORTH	SHELDON	, ντ
EPA SAMPLE NUMBER: SAMPLE LOCATION: LABORATORY SAMPLE NUMBER: SAMPLE TYPE: MATRIX/ANALYSIS: DILUTION FACTOR: DATE SAMPLED: DATE ANALYZED: PERCENT SOLID:	AJJ74 SS-01 WK1679-2 Routine S SOIL/LOW 1.0 11/15/94 11/16/94 71	ample	AJJ75 SS-02 WK1679-3 Routine SOIL/LOW 1.0 11/15/94 11/16/94 85	iample	AJJ76 SS-03 WK1679-4 Routine S SOIL/LOW 1.0 11/15/94 11/16/94 86	Sampte	AJJ77 SS-04 WK1679-1 Routine 5 SOIL/LOW 1.0 11/15/94 11/16/94 48	ample	AJJ78 SS-05 WK1679-5 Routine S SOIL/LOW 1.0 11/15/94 11/16/94	Sample	AJJ80 SD-01 IWK1679-6 Routine S SOIL/LOW 1.0 (11/15/94 11/16/94	Sample
VOA					· · · · ·	-				_		
Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethene 1,1-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene 2-Butanone 1,1,1-Trichloroethane 2-Butanone 1,1,1-Trichloroethane Carbon Tetrachloride Bromodichloromethane 1,2-Dichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropene Trichloroethene Dibromochloromethane 1,1,2-Trichloroethane Benzene trans-1,3-Dichloropropene Bromoform 4-Methyl-2-Pentanone 2-Hexanone Tetrachloroethene 1,1,2,2-Tetrachloroethane Toluene Chlorobenzene Ethylbenzene Styrene Xylene (total)	14 14 14 14 14 14 14 14 14 14 14 14 14 1	כבכנננכנננננננננננננננננננננננננ	122 122 122 122 122 122 122 122 122 122		122 122 122 122 122 122 122 122 122 122	200000000000000000000000000000000000000	21 21 21 21 21 21 21 21 21 21 21 21 21 2	333333335555555555555555555555555555555	144 144 144 144 144 144 144 144 144 144		16 16 16 16 16 16 16 16 16 16 16 16 16 1	

CADRE 1.92

Water units are reported in ug/L. Soil units are reported in ug/Kg.

FILENAME: AJJ74.SDG DATE: 12/28/94 TIME: 16:23

CASE NO: 22928 SDG NO: AJJ74		FULL SUI	•	TABLE ITT PAGE / OF TU SITE: BOISE CASCADE MORTH ABORATORY: ABB ENVIRONMENTAL	SHELDON, V?
EPA SAMPLE NUMBER: SAMPLE LOCATION: LABORATORY SAMPLE NUMBER: SAMPLE TYPE: MATRIX/ANALYSIS: DILUTION FACTOR: DATE SAMPLED: DATE ANALYZED: PERCENT SOLID:	AJJ81 SD-02 WK1679-7 Routine Sample SOIL/LOW 1.0 11/15/94 11/18/94 74	AJJ82 SD-03 WK1679-8 Routine Sample SOIL/LOW 1.0 11/15/94 11/18/94 74	AJJ83 SD-04 WK1679-9 Routine Sample SOIL/LOW 1.0 11/15/94 11/18/94 83	AJJB4 SD-05 WK1679-10 Routine Sample SOIL/LOW 1.0 11/15/94 11/18/94 82	
VOA Chloromethane	14 υ	14 U	*2	43	
Bromomethane Vinyl Chloride Chloroethane Methylene Chioride Acetone Carbon Disulfide 1,1-Dichloroethene 1,1-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene 2-Butanone 1,1,1-Trichloroethane Carbon Tetrachloride Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropene Trichloroethene Dibromochloromethane 1,1,2-Trichloroethane 8-nance trans-1,3-Dichloropropene Bromoform 4-Methyl-2-Pentanone 2-Hexanone Tetrachloroethene 1,1,2,2-Tetrachloroethane Toluene Chlorobenzene Ethylbenzene	14444444444444444444444444444444444444	14 14 14 14 14 14 14 14 14 14 14 14 14 1	12 12 12 12 12 12 12 12 12 12 12 12 12 1	12 U U U U U U U U U U U U U U U U U U U	
Styrene Xylene (total)	14 Ŭ 14 U	14 U	12 U 12 U	12 U 12 U	

FILENAME: AJJ74.SDG DATE: 12/28/94 Water units are reported in ug/L. Soil units are reported in ug/Kg.

TIME: 16:23

CADRE 1.92

SHELDON, VI

	SDG NO: AJJ74						L	TIZ Yaqtaaqba.	: BOISE : ABB E	CASCADE (NVIRONMEN	NORTH TAL	SHELDON,	¥Τ
	EPA SAMPLE NUMBER: SAMPLE LOCATION: LABORATORY SAMPLE NUMBER: SAMPLE TYPE: MATRIX/ANALYSIS: DILUTION FACTOR: DATE SAMPLED: DATE EXTRACTED: DATE ANALYZED: PERCENT SOLID:	AJJ74 SS-01 WK1679-2 Routine: S01L/LOW 1.0 11/15/94 11/21/94 12/02/94 71		AJJ75 SS-02 WK1679-3 Routine SOIL/LOW 1.0 11/15/94 11/21/94 12/02/94 B5	Sample	AJJ76 SS-03 WK1679-4 Routine S SOIL/LOW 1.0 11/15/94 11/21/94 12/02/94		AJJ77, A \$5-04 WK1679-1 Routine SOIL/LOW 1.0, 2 11/15/94 11/21/94 12/02/94	JJ770L Sample	AJJ78 SS-05 WK1679-5 Routine S SOIL/LOW 1.0 11/15/94 11/21/94 12/05/94 71	_	AJJ80 SD-01 IMK1679-6 Routine S SOLL/LOW 1.0 11/15/94 12/06/94 12/14/94	iample
	BNA									 -		 _	
	Phenol bis(2-Chloroethyl) ether 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 2-Methylphenol 2,2'-oxybis(1-Chloropropane) 4-Methylphenol N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene Isophorone 2-Nitrophenol 2,4-Dimethylphenol bis(2-Chloroethoxy) methane 2,4-Dimethylphenol bis(2-Chloroethoxy) methane 4-Chloroaniline Hexachlorobutadiene 4-Chloroaniline Hexachlorobutadiene 4-Chloroaniline Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2,4-Dinitrotoluene 3-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrotoluene 0iethylphthalate 4-Chlorophenol Dibenzofuran 2,4-Dinitrotoluene Diethylphthalate 4-Chlorophenyl-phenyl ether Fluorene 4-Nitroaniline 4-Somophenyl-phenylether Hexachlorobenzene Pentachlorophenol Phenanthrene Anthracene Carbazole Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate Fluoranthene Pyrene Butylbenzylphthalate	460 460 460 460 460 460 460 460 460 460		390 390 390 390 390 390 390 390 390 390		380 380 380 380 380 380 380 380 380 380		690 690 690 690 690 690 690 690 690 690	55 5	460 460 460 460 460 460 460 460 460 460		5440 5440 5440 5440 5540 5540 5540 5540	899333333333333333333333333333333333333
[)1-n-octylphthalate	460 460	U	390 390	ย	380 380	U	1700 690	ارن	460	ũ	540 540	nn
l e	Benzo(b)fluoranthene Benzo(k)fluoranthene	460 460	U	390 390	Ü	380	ŭ	6300	1	460 460	Ü	540 540	na na
E	enzo(a)pyrene ndeno(1,2,3-cd)pyrene	460	ŭ	390	ū	380 380	ן ע	2100 4000		460 460	Ŭ	540	ונט
įν	'IDENZ(a.n)anthracene	460 460	U	390 390	U	380	Ü	3500	J	460	Ū	540 540	n) n)
_ B	enzo(g,h,i)perylene	460	ŭ	390 390	ü	380 380	U	. 700 24 00	ا ز	460 460	ŭ	540	UJ
	LENAME: AJJ74.SDG DATE: 12/2	8/94 TIME:	16:23	CADRE 1	.92					400	u j	540	

THE CONTRACT WALL PRINCIPLE

Water units are reported in ug/L. Soil units are reported in ug/Kg.

CASE NO: 22928 SDG NO: AJJ74		erniyeta.,	JULE MAREISIS	SITE: BOISE CASCADE NORTH ABORATORY: ABB ENVIRONMENTAL	SHELDON, VI
EPA SAMPLE NUMBER: SAMPLE LOCATION: LABORATORY SAMPLE NUMBER: SAMPLE TYPE: MATRIX/ANALYSIS: DILUTION FACTOR: DATE SAMPLED: DATE EXTRACTED: DEFECENT SOLID:	AJJ87 SD-02 WK1679-7 Routine Sample SOIL/LOW 1.0 11/15/94 11/21/94 12/05/94 74	AJJ82 SD-03 WK1679-8 Routine Sample SOIL/LOW 1.0 11/15/94 11/21/94 12/05/94 74	AJJ83 SD-04 WK1679-9 Routine Sample SOIL/LOW 1.0 11/15/94 11/21/94 12/05/94 83	AJJ84 SD-05 WK1679-10 Routine Sample SO11/LOW 1.0 11/15/94 11/21/94 12/05/94 82	
Phenol					
Phenol bis(2-Chloroethyl) ether 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 2,2-Dichlorobenzene 2-Methylphenol 2,2'-oxybis(1-Chloropropane) 4-Methylphenol N-Nitroso-di-n-propytamine Hexachloroethane Nitrobenzene lsophorone 2-Nitrophenol 2,4-Dimethylphenol bis(2-Chloroethoxy) methane 2,4-Dichlorophenol 1,2,4-Trichlorobenzene Naphthalene 4-Chloro-3-methylphenol 2-Methylnaphthalene Hexachlorobutadiene 4-Chloro-3-methylphenol 2-Methylnaphthalene Hexachlorocyclopentadiene 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrotoluene Dienzofuran 2,4-Dinitrotoluene Diethylphthalate 4-Chlorophenol benzofuran 2,4-Dinitrotoluene Diethylphthalate 4-Chlorophenyl-phenylether Huorene 4-Nitroaniline 4-Sinitrosodiphenylamine 4-Bromophenyl-phenylether Hexachlorobenzene Pentachlorophenol Phenanthrene Anthracene Carbazole Di-n-butylphthalate Fluoranthene Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate Benzo(b)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene	440 440 440 440 440 440 440 440 440 440	440 440 440 440 440 440 440 440	4000 9400 9400 960 944444444444444444444	400 UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU	
Dibenz(a,h)anthracene Benzo(g,h,i)perylene	440 U 440 U 440 U	440 ช 440 บ 440 บ	400 U 400 U 400 U	400 U 400 U	į
FILENAME: AJJ74.SDG DATE: 12/2			400 u	400 U	

Water units are reported in ug/L. Soil units are reported in ug/Kg.

FILENAME: AJJ74.SDG DATE: 12/28/94 TIME: 16:23 CADRE 1.92

Sample Location	SS-01	SS-02	SS-03	SS-04	SS-05	SO-01	SD-02	SD-03	SD-04	SD-05
Traffic Report Number	AJJ74	AJJ75	AJJ76	AJJ77	AJJ78	AJJ80	AJJ81			
Remarks	<u> </u>	. <u>. </u>			1	A3300	AJJ81	AJJ82	AJJ83	AJJ84
Nemarks			DUP AJJ75		<u> </u>			DUP AJJ81	 	
Sampling Date	15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	1 45 51		<u> </u>			1
			15-1404-54	12-1404-94	15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	15-Noy-94
Extraction Date	22-Nov-94	22-Nov-94	22-Nov-94	22-Nov-94	22-Nov-94	22-Nov-94	22-Nov-94	22-Nov-94	22-Nov-94	22-Nov-94
Analysis Date	05-Dec-94	05-Dec-94	05-Dec-94	09-Dec-94	05-Dec-94	07-Dec-94	07-Dec-94	08-Dec-94		
Ditution Factor	1.0	 			00 200 04	01-Dec-94	07-Dec-94	08-Dec-94	08-Dec-94	08-Dec-94
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Percent Solids	71%	85%	86%	48%	71%	61%	74%	74%		
PESTICIDE/PCB COMPOUND	<u> </u>		ļ	-	ļ		/476	/4%	83%	82%
alpha-BHC	 	<u></u>								
eta-BHC	2.4 U	2.0 U	2.0 U	R	2.4 U	2.8 U	2.3 U	2.3 U	2.0 U	
elta-BHC	2.4 U	2.0 ∪	2.0 U	R	2.4 U	2.8 U	2.3 U	2.3 U		2.1
amma-BHC (Lindane)	2.4 U	2.0 ∪	2.0 U	R	2.4 U	2.8 U	23 0	2.3 U	2.0 U	2.1
	2.4 U	2.0 U	2.0 ∪	R	2.4 U	2.8 U	2.3 U		2.0 U	2.1
leplachlor	2.4 U	20 U	2.0 U	Ŕ	24 Ü	2.8 U		2.3 U	2.0 U	2.1
ddrin	2.4 U	2.0 U	2.0 U	Ř	2.4 U		2.3 U	2.3 U	20 U	2.1
leptachlor epoxide	2.4 U	2.0 U	2.0 U	R	2.4 U	2.8 U	2.3 U	2.3 U	2.0 U	2.1
ndosulfan i	2.4 U	2.0 U	2.0 U	R	2.4 U	2.8 U	2.3 U	2.3 U	2.0 U	2.1
lieldrin ,	4.6 U	3.9 U	3.8 U	R		2.8 U	2.3 U	2.3 U	2.0 U	2.1
,4'-DDE	8.2	3.9 U	3.8 U		4.6 U	5.4 U	4.5 U	4.5 ∪	4.0 U	4 0
ndrin (4.6 U	3.9 U		R	6.0 LU	5.4 U	4.5 U	4.5 U	4.0 U	4.0
ndosulfan II	4.6 U		3.8 U	R	4 6 U	5.4 U	4.5 U	4.5 U	4.0 U	4.0
4'-DOD	4.6 U	3.9 U	3.8 U	R	4 6 U	5.4 U	4.5 U	4.5 U	4.0 U	4.0
ndosulfan sulfate	4.6 U	3.9 U	3.8 U	R	4.6 U	5.4 U	4.5 U	4.5 U	4.0 U	4.0
4'-DDT		3.9 U	3.B U	R	4.6 U	5.4 U	4.5 U	4.5 U	4.0 U	
ethoxychior	5.1	3.9 U	3.8 U	R	R	5.4 U	4.5 U	4.5 U	4.D U	4.0
ndrin ketone	24 U	20 U	20 U	R	24 U	28 U	23 U	23 U		4.0
	4.6 U	3.9 U	3.8 U	61 J	4.6 U	5.4 U	4.5 U	4.5 U	20 U	21
ndrin aldehyde	4.6 U	3.9 U	3.8 U	R	4.6 U	5.4 U	4.5 U		40 U	4.0
pha-Chlordane	2.4 U	2.0 U	2.0 ∪	R	2.4 U	2.8 U	23 U	4.5 U	4.0 U	4.0
imma-Chlordane	2.4 ป	2.0 ∪	2.0 U	Ř	2.4 U	2.8 U	2.3 U	2.3 U	2.0 U	2.1
exaphène	240 U	200 U	200 U	R I	240 U	280 U		2.3 U	2.0 U	2.1
octor-1016	46 U	39 U	38 U	R I	46 U		230 U	230 U	200 U	210
oclor-1221	94 U	79 Ŭ	78 U	Ĥ,	94 U	54 U	45 U	45 U	40 U	40
octor-1232	46 U	39 U	38 1		I	110 U	91 U	91 U	81 U	82
oclor-1242	46 U	39 U	38 U	R	46 U	54 U	45 U	45 U	40 U	40
octor-1248	46 Ŭ	39 U		R	46 U	54 U	45 U	45 U	40 U	40
pclor-1254	46 U		38 U	R	46 U	54 U (45 U	45 U	40 U	40 (
oclor-1260	46 U	39 U	38 U	140 J	46 U	54 U	45 U	45 U	40 U	40 (
	40 U	39 U	38 U	R J	46 U	. 54 U	45 U	45 U	40 U	40 t

J - The associated numerical value is an estimated quantity.
U - The compound was not detected. The associated numerical value is the compound quantitation limit.

UJ - The compound was not detected. The compound quantitation limit is an estimated value

R - The datum was rejected.

Data Summary Key

- A Acceptable data.
- J The associated numerical value is an estimated quantity.
- The compound was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.
- UJ The compound was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.
- Reject data because quality control criteria were exceeded. The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.

ATTACHMENT B

Boise Cascade/North Landfill/Lagoon

Inorganic Sample Analytical Results CDM Federal Programs Corporation

November 15, 1994 (sampling date)

7710023-29AU(BOIS-DFT.RPT)

Site: Boise Cascade North Laboratory: Skinner & Sherman

Disk: 7710023-DV07 File: 22928MAR.WK4

CLP INORGANIC ANALYSIS CASE: 22928, SDG; MAFT71 & MAFW08 AQUEOUS ANALYTICAL RESULTS (ug/L)

Table !! Page 1 of 2

Sample Location				WS-01	WS-02	GW-01	GW-02	SW-01	EB-SS	EB-SD	EB-GW	EB-WS
Traffic Report Number				MAFW08	MAFW09	MAFW10	MAFW11	MAFW13	MAFW14	MAFW15	MAFW16	MAFW17
Remarks	- -			-	 		5	ļ <u>.</u>				
		,					Ouplicate of MAFW10		Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sampling Date				15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94
Dilution Factor	- .	·	· · · · · ·	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1,0
NORGANIC ANALYTES		T IOL	CROL.	<u> </u>		ļ		<u> </u>	1.0	1.0	1.0	1.0
THE PROPERTY OF		(vg/L)	(ug/L)									<u> </u>
Aluminum	P	22.4	200	382	507	18400	18800	20700				<u> </u>
Antimony	P	11.2	60		11.2 U	11.2 U	11.2 U	12.3	22.4 U 14.8 J	22.4 U	22.4 U	33.4 7
Arsanic	P	1.7	10	3.0 UJ	4.0 U	10.3 U	9.7 U	35.4	14.8 J	11.2 U	11.2 U	11.2 (
Barlum 	P	0.4	200	70.7	73,6	117	125	176	0.59	1.7 U 0.59	1.7 U	1.7 (
Seryllium .	P	0.3	5	D.3 U	0.3 U	1.0	1.0	0,77	0.3 U	0.59	0.4 U	0.78
Cadmium	P	1.4	5	1.4 U	1.4 U	1.4 U	1.4 U	1,4	1.4 U	1.4 U	0.3 U	0.3 (
Calcium	P	73.4	5000	145000	148000	16200	17100	16900	73.4 U	73.4 U	1.4 U 73.4 U	1.4 0
Chromium	P	1.7	10	1.7 ป	1.7 U	69.6	74.5	58.1	1.7 U	1.7 U	1.7 U	2610
Cobalt	P	2.3	50	4.8 U	4.1 W	22.4	23.8	25.9	2.3 U	2.3 U	2.3 U	1.7 (
Copper	þ	2.1	25	7.5 U	7.1 U	86.0	90.6	34,7 U	2.1 U	2.1 U	2.1 U	2.3 (
ron	P	5.3	100	151	161	30600	31900	37200	6.9 J	11.9	5.3 J	2.4 .
esd .	P	0.7	3	1.8	1.3 J	35.0	38.8	26.2	0.74 J	1.5	1 0.3 3	
fegnesium	P	19.8	5000	6380	6430	14600	15100	13300	19.8 U	19.8 U	19.5 Ŭ	1.2 . 25.5
langanese	P	0.9	15	254	307	1580	1690	3460	0.9 U	0.9 U	0.9 U	0.9 (
fercury lickel	CV	0.2	0.2	0.5 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 Ŭ	0.2 U	0.2 U	0.2
rickei ofassium	P	3.5	40	5.2 UJ	4.3 UJ	95.0	102	85.4	3.5 U	3.5 U	3.5 U	3.5 (
otassum Glenium	P	54.3	5000	7030	6470	4730	4810	3550	54.3 U	97.5 J	86.7 J	137
eremum Nver	_ P_ I	2.5	5	3.4 UJ	2.5 U	2.5 UJ	2.7 UJ	2.5 U	2.9 J	2.5 U	2.5 U	2.5 t
aver odium		2.4	10	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 1
ballium hallium	P	26.5	5000	101000	104000	8410	8880	4840	26,5 U	26.5 U	35.2	33.4
aanum anndlum	P	1.7	10	1.7 U	2 UJ	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 L
aneolum Inc	l. 1	2.3	50	6.9	6.6	44.8	44.9	29.7	2.3 U	2.3 U	2.3 U	2.3 (
yanide	P	6.3	20	25.9 U	23,1.U	123	136	146 U	6.3 U	6.3 U	6.3 U	54.2
Permue .	AS	- 1	10	10 (),	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 W	10 0

F Furnace

P ICP/Flame AA

CV Cold Vapor

A5 Semi-Automated Spectrophotometric

Analysis

J - The associated numerical value is an estimated quantity.

U - The analyte was not detected. The associated numerical value is the analyte detection limit.

UJ - The analyte was not detected. The analyte detection limit is an estimated value.

R - The datum was rejected.

IDL - Instrument Delection Limit

CRDL - Contract Required Detection Limit

Site: Boise Cascade North Laboratory: Skinner & Sherman

Disk: 7710023-DV07 File: 22928MSR.WK4

CLP INORGANIC ANALYSIS CASE: 22928, SDG: MAFT71 and MAFW08 SOIL ANALYTICAL RESULTS (mg/Kg)

Table II Page 2 of 2

Sample Location		SS-01	SS-02	SS-03	\$5-04	SS-05	SD-01	SD-02	SO-03	SD-04	SD-05
Traffic Report Number		MAFT71	MAFT 72	MAFT73	MAFT98	MAFT99	MAFW01	MAFW02	MAFW03	MAFW04	MAFYY05
Remarks	··-	 		Duplicate of	 -	ļ	<u> </u>				777 1103
				MAFT72	•		1		Duplicate of MAFWD2		1
Sampling Date		11/15/94	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94
Percent Solid		72.0	82.5	81.2	50.3	69.3		<u> </u>		<u>l</u> .	
				31.2	30.3	09.3	58.7	69.6	71.0	78.9	83.9
ilution Factor		1.03	1.05	1.02	1.06	1.05	1.05	1.10	1.04	1.03	1.00
NORGANIC ANALYTES		, <u>, , , , , , , , , , , , , , , , , , </u>		<u> </u>						-	
Vuminum	[ř	8460	12900	11500	10300	11500	8910				
nlimony	P	3.6 UJ	2.5 U	2.7 U	4.2 U	4.6 UJ	3.5 U	9330 2.9 U	8970	6570	3510
rsenic	F	7	5.3	4.8	6.9	3.7	3.4	1.4	3.0 U	2.8 U	2.1
orium 	P	52.1	59.4	50.8	99.2	73.8	48	38.3	1.5 38.2	2.2	1.
eryllium admium	P	0.41 U	0.46 U	0.5 U	0.18 UJ	0.36 U	0.34 ∪	0.28 U	0.29 U	26.6 0.27 U	10.
alcium alcium	P	0,38 U	0.32 U	0.34 U	0.83 U	0.38 U	0.45 U	0.37 U	0.38 U	0.27 U	0.1
ancium Promium	P 1	615	4830	8030	7360	1520	1870	1670	1580	2100	0.3
aromum obali	<u> </u>	9.4	24.8	22.9	27.1	20	20.6	18.9	26.2	11.7	1021
copper	Ľ	5.9	14	13	4.7 U	7.7	8.9	6.9	7.2	6.6	8.6 3.6
ohba.	P	28.2	37.6	32.7	119	20.1 J	16.1·UJ	11.9 UJ	19.2 J	14.2 UJ	3.0 4.5
ead		17000	24500	22600	17600	16100	12700	13100	12500	13600	7571
lagnesium	<u> </u>	31.5	10.7	10	118	26.6	7.2	7.0	0.9	0.6	4.3
anganese	P	1460	7500	7310	1460	2630	3810	3890	3770	3270	1890
ercury	cv	1270	667	B12	492	380	184	203	207	324	118
ickel	- CY	0.08 J	0.06 UJ	0,06 UJ	0.18 J	0.13 J	0.09 UJ	0,07 UJ	0.06 UJ	0.06 (7)	D.D6
olassium		7.5	38.1	34.6	18.6	19.6	23.6 J	18.7 J	68.9 J	15.5 J	10.6
elenium		386 0.67 U	1930	1710	388 ∪	583	498	441	452	487	210
Yer	E	1.5 U	0.58 UJ	0.6 U	0,94 U	0.69 U	0.81 U	0.85 U	0.68 U	0.62 U	0.56
odium	[[59.6 U	1.2 U	1.4 U	1.0 UJ	1.6 U	0.81 UJ	0.84 UJ	0.65 U	0.73 UJ	0.54
nalljum		0.46 U	113 U	101 U	18.9 UJ	68.7 U	87.3 U	87.9 U	87.9 U	58.8 U	52,4
madium	P	28.4	0.39 UJ	0.41 U	0.64 U	0.47 U	0.55 ป	0.44 U	0.48 U	0.42 U	0,38
nc		40.9	22.7	20.6	14.7	21.9	19.3	16	14.8	10.5	6.1
/anide	AS	9.56 UJ	61.5	57.6	236	66.5	49.3	40.3	41.6	40.1	24.5
	~~	0.95 01	0.57 UJ	0.6 UJ	1.8 J	0.67 UJ	0.65 UJ	0.7 UJ	0.67 UJ	0.59 UJ	0.8

Analytical Method

F Furnace P ICP

CV Cold Vapor

AS Semi-Automated

Spectropholometric

Analysis

Sample Results are reported on dry weight basis.

J - The associated numerical value is an estimated quantity.

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